NATURAL HISTORY,

GENERAL AND PARTICULAR,

BY THE

COUNT DE BUFFON.

TRANSLATED INTO ENGLISH,

ILLUSTRATED

WITH ABOVE THREE HUNDRED COPPER-PLATES,

AND OCCASIONAL

NOTES AND OBSERVATIONS,

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C O N T E N T S.

The Natural Hiftory of Man.

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ADVERTISEMENT.

AS the Natural Hiſtory of Quadrupeds commences in this Volume, the Tranſlator thinks it neceſſary to mention a few circumſtances, which, to ſome readers, might have the appearance of not cloſely following the original.

In the hiſtory of domeſtic animals, the COUNT DE BUFFON has not given the SYNONYMA of authors. The ſame omiſſion ſometimes happens in his account of wild animals. In all theſe inſtances, the Tranſlator has added the SYNONYMA from other ſources of information.

Another circumſtance muſt be noticed. Many articles of the original work were publiſhed near thirty years ago. The COUNT DE BUFFON quoted from the editions of books which were at that time the laſt. But, as many of theſe books have ſince undergone different impreſſions, and the authors have made conſiderable amendments in their definitions, and even in their ſyſtematic arrangements, the Tranſlator, in juſtice to theſe Naturaliſts, has referred to the paſſages and pages as they appear in the corrected editions. Hence the references in the traſlation frequently

 cor-

correſpond[illegible] with thoſe of the original. For the ſame r[illegible], ſeveral ſtrictures upon the writings of Sir Charles Linnæus, and others, could not be inſerted with any degree of propriety; becauſe, upon peruſal of the preſent editions, many of the inaccuracies, which the COUNT reprehends, have now no exiſtence.

night. We may, therefore, conclude, that the extent of our viſion is much greater than our firſt ſuppoſition; and that the reaſon why we are often unable to diſtinguiſh diſtant objects, is leſs owing to a defect of light, or to the ſmallneſs of the angle under which they are painted in the eye, than to the profuſion of rays reflected from intermediate objects, which, by their brilliancy, prevent us from perceiving the fainter and more diverging rays that proceed from diſtant objects. The retina of the eye is like a canvas upon which objects are painted. The colour of thoſe pictures are bright or obſcure in proportion to the diſtances of the objects repreſented. When objects are very remote, their pictures on the retina are ſo faint, that they are entirely obliterated by the vigorous and lively impreſſions made by nearer objects, with which we are every where environed. But, when the intermediate objects emit a feeble light only, compared with that which proceeds from remote objects, as, for example, when we view a luminous body in the night-time, then the diſtant object makes a diſtinct picture on the retina, and becomes perfectly viſible. It is a conſequence of theſe facts, that a man, by placing himſelf in the dark, and employing a long tube, may make a teleſcope, which will have a conſiderable effect even during the day. For the ſame reaſon, a man at the bottom of a deep pit can ſee the ſtars at noon; and this fact was not unknown

unknown to the ancients, as appears from the following paſſage of Ariſtotle: 'Manu enim 'admota ſuper fiſtulam, longius cernet. Qui- 'dam ex foveis puteiſque interdum ſtellas con- 'ſpiciunt.'

We may, therefore, affirm, that the human eye is capable of being affected with objects which ſubtend not an angle above a ſecond, or leſs, even when they reflect no more light than when they were ſeen under an angle of one minute; and, conſequently, that the powers of this organ are greater than was formerly imagined. But, if objects, without forming a greater angle, were furniſhed with a more intenſe light, we would ſee them at ſtill greater diſtances. A ſmall taper, when vivid, is ſeen much farther than a flambeau that emits a dim light. In order to determine the utmoſt diſtance at which an object can be rendered viſible, three things muſt be conſidered: 1. The largeneſs of the angle formed in the eye: 2. The degree of light with which the neighbouring and intermediate objects are illuminated; and, 3. The intenſity of the light proceeding from the object itſelf. Viſion is affected by each of theſe cauſes; and it is only by eſtimating and comparing them, that we can determine the diſtance at which any particular object can be diſcerned. The following is a demonſtrative proof of the influence of intenſity of light upon viſion. Teleſcopes and microſcopes are known to be inſtruments of the

ſame kind, each of them increaſing the viſible angle of objects, whether they be really minute, or appear ſo on account of their diſtance. Why then do teleſcopes with difficulty magnify objects a thouſand times, when a good microſcope magnifies more than a million? This difference, it is apparent, proceeds from the degree of light only; for, if we could illuminate diſtant objects with an additional quantity of rays, they would appear infinitely clearer, though ſeen under the ſame angle; and teleſcopes would have the ſame effect upon diſtant objects as microſcopes have upon thoſe which are minute. But this is not a proper place for expatiating on theſe ſubjects.

The diſtance at which any object can be ſeen is ſeldom the ſame in both eyes. There are few men who have both eyes equally ſtrong. When this inequality is great, the ſtrongeſt eye is moſt generally employed, which is the cauſe of ſquinting, as I have elſewhere proved *. When both eyes are equally ſtrong, and directed to the ſame object, one ſhould imagine that the viſion would be doubly diſtinct; but the difference has been found by experiment to be only one 13th part †; and this phænomenon may admit of the following ſolution. The two optic nerves, near the place where they come out of the ſkull, unite and then ſeparate by an obtuſe angle, before they

* See Mem. de l'Acad. année 1743.

† See Jurin's eſſays on diſtinct and indiſtinct viſion.

enter the eyes. The motion communicated to theſe nerves by the impreſſion of objects on the retina, cannot be tranſmitted to the brain without paſſing the united part. Hence theſe two motions muſt be combined, and produce a ſimilar effect, as when two bodies moving upon two ſides of a ſquare, and impinging on a third, make it move in the diagonal. Now, if the angle were about 115 or 116 degrees, the diagonal would be to the ſide as 13 to 12, which is the ſame ratio that the ſenſation reſulting from both eyes bears to that which reſults from one. The angle formed by the two optic nerves being nearly equal to that ſuppoſed above, the loſs of ſenſation may be attributed to this poſition of the nerves; and this loſs will always increaſe in proportion to the greatneſs of the angle.

Short-ſighted perſons are generally ſuppoſed to ſee objects larger than other men. But the reverſe is the truth; for they actually ſee them diminiſhed. I myſelf am ſhort-ſighted, and my left eye is ſtronger than my right. I have a thouſand times examined the ſame objects, as the letters of a book, at the ſame diſtance, firſt with the one eye, and then with the other, and uniformly found that objects appeared both cleareſt and largeſt to the left eye; and, when I diſtorted one of my eyes to make an object appear double, the image preſented to the right eye was leſs than the other. I cannot, therefore, heſitate in pronouncing, that the more ſhort-ſighted any

man

man is, he ſees objects proportionally diminiſhed. I examined ſeveral perſons who had eyes unequal in ſtrength, and all of them declared that they ſaw objects larger with the ſtrong than with the weak eye. This phænomenon is perhaps the effect of habit; for ſhort-ſighted people, being accuſtomed to approach cloſe to objects, and to view a ſmall portion of them only at a time, their eyes acquire a ſtandard of magnitude much leſs than other men, who can take in at once all the parts of large bodies.

Short-ſightedneſs has been often aſcribed to a roundneſs or prominence of the eyes. But this cauſe is not ſatisfactory; for ſome have ſuddenly become ſhort-ſighted, as the young man mentioned by Mr. Smith in his optics *, who became ſhort-ſighted on coming out of a cold bath, and who, from that period, was always obliged to uſe a concave glaſs. It cannot be ſuppoſed that the cryſtalline and vitreous humours were all at once inflated to ſuch a degree as to produce this difference in viſion. Short-ſightedneſs may as well proceed from the reſpective poſition of the different parts of the eye, and eſpecially of the retina, as from the form of the humours; it may proceed from a leſs degree of ſenſibility in the retina, from a ſmallneſs of the pupil, &c. In the two latter caſes, it is true, concave glaſſes would be uſeleſs, and even hurtful; in the two former, they may be employed with advantage.

* Vol. ii. p. 10.

But ſtill, objects ſeen through theſe glaſſes are neither ſo [illegible]ſtinct, nor perceived at ſuch a diſtance, as other men ſee them with the naked eye; becauſe ſhort-ſighted perſons, as formerly remarked, ſee the pictures in a diminiſhed form, and concave glaſſes diminiſh them ſtill farther: Whenever, therefore, theſe pictures become ſo ſmall as to make too faint an impreſſion on the retina, they ceaſe to be viſible; conſequently, people who labour under this defect, ſee not ſo far with the aſſiſtance of glaſſes as other men do with their eyes.

As the eyes of infants are leſs than thoſe of adults, they muſt likewiſe ſee objects leſs; becauſe the greateſt angle which an object can form in the eye muſt always be proportioned to the dimenſions of the retina: If the field of the retina, where the pictures of objects are formed, be ſuppoſed to be ha[illegible] in adults, it will not exceed a third or a fourth of an inch in infants. Children, of courſe, cannot ſee ſo far as adults; for, as objects appear leſs to them, they muſt ſooner become inviſible. But as, in infants, the pupils are larger, in proportion to the ſize of their eyes, than thoſe of adults, they may derive ſome ſmall advantage from this circum[illegible]nce.

[illegible]ld men, as the humours of their eyes are ſaid to [illegible] dried up, ought to ſee nearer than young me[illegible]: But the reverſe is true; for old men

men ſee beſt at a diſtance. This alteration cannot proceed entirely from a diminution, or a flattening of the humours of the eye, but rather from a change of poſition between its parts, as between the cornea and the cryſtalline, or between the vitreous humour and the retina. This may be eaſily underſtood, by ſuppoſing that the cornea becomes more ſolid as we advance in years, and, conſequently, that it cannot readily aſſume that convexity which is neceſſary in order to ſee near objects; and, as it muſt be flattened by drying, this circumſtance alone is ſufficient to make old men ſee beſt at a diſtance.

Clear and *diſtinct* viſion, though different in their nature, are terms very generally confounded by writers on optics. We ſee an object *clearly*, whenever it is ſufficiently illuminated to enable us to form a general idea of its figure; but we ſee it not *diſtinctly*, till it be ſo near that we can examine all its parts. When we view a diſtant tower, we ſee it clearly as ſoon as we perceive it to be a tower; but we ſee it not diſtinctly till we approach ſo near as to be able to determine not only its general dimenſions, but to diſtinguiſh the parts of which it is compoſed, as the order of architecture, the materials, the windows, &c. We may, therefore, ſee an object clearly without ſeeing it diſtinctly, and we may ſee it diſtinctly without ſeeing it clearly; becauſe

diſtinct viſion implies a ſucceſſive examination of the different parts of objects. Old men ſee clearly, but not diſtinctly: They perceive large or luminous objects at a diſtance; but they are unable to diſtinguiſh ſmall objects, as the characters of a book, without the aſſiſtance of magnifying glaſſes. Short-ſighted perſons, on the contrary, ſee ſmall objects diſtinctly; but they have no clear viſion of large objects, unleſs they are diminiſhed by concave glaſſes. A great quantity of light is neceſſary for clear viſion, and a ſmall quantity is ſufficient for diſtinct viſion. Hence ſhort-ſighted people ſee better in the night than other men.

When an object is too brilliant, or when the eye fixes too long upon the ſame object, the organ is injured or fatigued, viſion becomes indiſtinct, and the image of the object, having made an impreſſion too violent, or remained too long on the retina, ſeems, for ſome time, to be painted on every body we look at. But I will not enlarge on this ſubject, becauſe I have elſewhere given a full explication of it *. I ſhall only obſerve, that nothing perhaps is more deſtructive to the eye than too great a quantity of light. Blindneſs is exceedingly frequent in the northern regions, where the ſnow, illuminated by the rays of the ſun, obliges travellers to cover their eyes with crape, to prevent the

* See Mem. de l'Acad. année 17[illegible]3.

dangerous, and often ſudden, effects of too much light. In the ſandy deſerts of Arabia, the reflection of the light is ſo violent, that the eyes are unable to ſupport it. Such perſons, therefore, as are obliged to write or read long at a time, ſhould beware of uſing a ſtrong light.

SECT. VII.

Of the Senſe of Hearing.

THE ſenſe of hearing, like that of ſeeing, conveys perceptions of diſtant objects; it is, of courſe, ſubject to ſimilar errors, and muſt deceive us, when we have no opportunity of rectifying, by the touch, the ideas it excites. The ſenſe of hearing communicates no diſtinct intelligence of the diſtance of ſonorous bodies. A great noiſe at a diſtance, and a ſmall one when near, produce the ſame ſenſation; and, unleſs we derive aid from the other ſenſes, we cannot diſtinguiſh the diſtance of the one from that of the other.

When we hear an unknown ſound, we can neither judge of the diſtance, nor of the momentum of the ſtroke which gives riſe to it. But, whenever we can aſcertain the ſpecies of any individual ſound, we are able to gueſs both at the diſtance and momentum of the ſtroke. If, for example, we hear the report of a cannon, or the ſound of a bell, we compare them with thoſe of the ſame kind which we have formerly heard, and form a groſs judgment both of their diſtance and momentum.

Every

Every body that impinges on another produces ſound: This ſound, in non-elaſtic bodies, is ſimple, but multiplied in thoſe which are elaſtic. When we ſtrike a bell, a ſingle ſtroke produces a ſound, which is ſucceſſively repeated as long as the ſonorous body continues to vibrate. If, therefore, we had not acquired the habit of judging every ſound to be ſingle which is produced by one ſtroke, we would conceive all ſounds to be multiplied. On this ſubject, I ſhall relate an incident that happened to myſelf. When lying in bed half aſleep, my clock ſtruck, and I counted five ſtrokes of the hammer on the bell, which I heard diſtinctly. I immediately roſe, and, upon examination, found, that it was only one o'clock, and that one ſtroke only had been ſtruck on the bell; for there was not the ſmalleſt derangement in the machinery. After a little reflection, I concluded, that, if we knew not from experience that a ſingle ſtroke ſhould produce but one ſound, every vibration of a bell would be heard as a ſeparate ſound, and as if ſeveral ſtrokes had ſucceſſively been repeated on the ſonorous body. When I heard the clock ſtrike, I was in the ſame ſituation with a perſon who had heard for the firſt time, and who, having no idea of the manner in which ſound is produced, would judge only by the impreſſion made on the ear; and, on this ſuppoſition, he would hear as many diſtinct ſounds as there were ſucceſſive vibrations.

It is the number of vibrations excited in elaſtic bodies which conſtitutes the tone of ſound. There is no tone in a ſimple ſound. The report of a gun, or the crack of a whip, produce different ſounds; but they have no tone. It is the ſame with every inſtantaneous ſound. Tone conſiſts in the duration of the ſame ſound for a certain time. This duration of ſound may be effected in two different ways: The firſt, and moſt common, is the ſucceſſion of vibrations in elaſtic and ſonorous bodies. But the ſame effect may be produced in non-elaſtic bodies by a quick repetition of ſtrokes; for a ſucceſſion of vibrations acts upon the ear in the ſame manner as if each vibration were a ſeparate ſtroke.

By conſidering, in this view, the production of ſound, and the different tones which modify it, we ſhall find, that a repetition of equal ſtrokes is neceſſary to produce a tone from bodies incapable of vibration. If the number of equal ſtrokes be augmented in the ſame time, the tone will only be rendered more equal and perceptible, without changing either the ſound or the tone produced by the ſtrokes. But, if the force of the equal ſtrokes be augmented, the ſound will be ſtronger, and the tone may be changed. For example, if the force of the ſtroke be doubled, it will produce a ſound double ſtrong; and if the tone of the former was an octave, that of the latter will be doubly grave.

May not elaſtic bodies, when ſet a vibrating by a ſingle ſtroke, be regarded as bodies whoſe figure and length preciſely determine the force of the ſtroke, and limit it to the production of a certain ſound only? If one ſtroke on a bell have only half the force of another, it will not be heard at ſo great a diſtance, but it will ſtill produce the ſame tone. It is the ſame with the ſtring of an inſtrument; the ſame length gives always the ſame tone. Should not this lead us to think, that, in the explication of the production of different tones by the greater or ſmaller number of vibrations alone, we miſtake the effect for the cauſe? For, the vibrations of ſonorous bodies being nothing elſe than what is produced in non-elaſtic bodies by a frequent repetition of equal ſtrokes, a greater or leſſer number of vibrations ſhould have no more influence, with regard to tones, than the quicker or ſlower repetition of ſtrokes made upon bodies which do not vibrate. Now, this quicker or ſlower repetition of ſtrokes produces no change; neither ought the frequency of vibrations; and the tone, which, in the firſt caſe, depends upon the force of the ſtroke, depends, in the ſecond caſe, upon the volume of the ſonorous body. If it be double the thickneſs, and of the ſame length, or double the length, and of the ſame thickneſs, the gravity of the one will be double, in the ſame manner as the tone of a non-elaſtic body is doubly grave,

grave, when ſtruck with a double weight or force.

If we ſtrike a body incapable of vibrating, with a double force, or a double maſs of matter, it will produce a ſound doubly grave, or an octave lower; for it is the ſame thing as if we ſtruck with two equal maſſes inſtead of one of them, which would neceſſarily double the intenſity of the ſound. Suppoſe, then, that two non-elaſtic bodies are ſtruck, the one with a ſingle maſs, the other with two, each of them equal to the firſt; a ſound would be produced by the firſt body, whoſe intenſity would be only one-half of that produced by the ſecond. But, if we ſtrike one of theſe bodies with two maſſes, and the other with three; in this caſe, the firſt body would produce a ſound, the intenſity of which would be one-third leſs than that produced by the ſecond. In the ſame manner, if we ſtrike the one body with three equal maſſes, and the other with four, the former will produce a ſound, the intenſity of which will be one-fourth leſs than that produced by the latter. Now, in comparing numbers, we comprehend them moſt eaſily in the proportions of one to two, one to three, one to four, &c.; and, of all the proportions comprehended between the ſingle and the double, thoſe which we perceive with the greateſt facility, are two to one, three to two, four to three, &c. Thus, in judging of ſounds, the octave correſponds beſt with the original

original ſound, then the fifth, and then the fourth; becauſe theſe ſounds are in the above proportion. For, if we ſuppoſe the ſmall bones of the ear to be hard unelaſtic bodies, which receive ſtrokes of equal maſſes of matter, we would more eaſily refer the ſound produced by one of them to a certain ſtandard, if the other ſounds were produced by maſſes that were proportioned to the firſt, as 1 to 2, 2 to 3, or 3 to 4; becauſe theſe are the proportions which the mind recogniſes with the greateſt facility. Thus, in conſidering ſound as a ſenſation, the pleaſure ariſing from harmony appears to conſiſt in the proportion between the fundamental ſound and the others by which it is ſucceeded. If theſe other ſounds meaſure exactly the fundamental ſound, they will be always harmonious and agreeable; but, if they are incommenſurable, they will be harſh and diſcordant.

It may be aſked, why ſhould one proportion, when it is exact, be more agreeable than another, which is leſs exact? I anſwer, that the cauſe of pleaſure originates from this juſtneſs of proportion; for, whenever our ſenſes are acted upon in this manner, an agreeable ſenſation is the reſult; and diſproportion, on the contrary, is always diſagreeable. We may recollect what was ſaid concerning the blind man who received his ſight from the dexterity of Mr. Cheſſelden. When he began to ſee, regular objects were more agreeable to him than thoſe which were rough and irregular. It is, therefore, unqueſtionable,

able, that the idea of beauty, and the pleafing fenfations we receive by the eye, originate from regularity and proportion. It is the fame with the fenfe of touching: Smooth, round, and uniform bodies, afford us more pleafure than thofe which are rough and unequal. Thus the pleafure arifing from the fenfe of touching, as well as from that of feeing, is founded in the proportion of objects. Why, therefore, fhould not the pleafures of the ear proceed from the proportion of founds?

Sound, like light, is not only propagated at a diftance, but is capable of being reflected. The laws which regulate the reflection of found are not indeed fo well underftood. All we know is, that found is reflected when its motion is interrupted by hard bodies: A mountain, a houfe, a wall, reflect found, and fometimes fo perfectly, that we imagine it proceeds from a direction oppofite to that of its original motion. Smooth concave furfaces, as vaults, hollow rocks, &c. produce the moft diftinct echoes. The internal cavity of the ear is fitted for reflecting found in the moft perfect manner. It is hollowed out of the hard part of the temporal bone, like a cavern in a rock. In this cavity founds are repeated and articulated; this repetition of found excites vibrations in the folid parts of the lamina of the cochlea, which are communicated to the membraneus part of the lamina; and this membranous part is an expanfion of the auditory nerve,

nerve, which conveys theſe different vibrations to the mind. As the oſſeous parts are ſolid and inſenſible, they can receive and reflect ſounds only; the nerves alone are capable of producing ſenſation. Now, in the organ of hearing, the only nervous part is a portion of the ſpiral lamina; all the reſt is ſolid; and hence I have made this part the immediate organ of hearing, which may be further proved by the following reflections.

The external ear is only an acceſſory to the internal. Its concave windings may augment the quantity of ſound; but we can hear very well without the external ears, as appears from dogs and other animals, which have had theſe organs cut off. The membrane of the tympanum is not more eſſential to the perception of ſound than the external ear; for many perſons have heard diſtinctly after this membrane was either entirely or partly deſtroyed. Some perſons can make the ſmoke of tobacco, ſilk cords, lead plates, &c. paſs from the mouth to the ear, and yet they hear as well as other men. Neither do the ſmall bones of the ear ſeem to be eſſential to hearing. It has frequently happened, that theſe bones have been carious, and have even come out of the ear, without deſtroying the ſenſe of hearing. Beſides, birds have no ſuch bones; and yet they have moſt delicate ears. The ſemicircular canals appear to be more neceſſary. They are a kind of winding tubes in the os petroſum,

 that

that ſeem to direct and conduct the ſonorous particles to the membranous part of the cochlea, upon which ſound acts, and the ſenſation of it is produced.

Deafneſs is incident to old age; becauſe the denſity of the membranous part of the lamina of the cochlea augments in proportion as we advance in years. When this part becomes too ſolid, the perſon grows dull of hearing; and when it is entirely oſſified, deafneſs is the conſequence; becauſe there is no longer any ſenſible part of the organ capable to tranſmit the ſenſation of ſound to the mind. A deafneſs proceeding from this cauſe is incurable. But, when it proceeds from a ſtuffing of the auditory canal with wax, or other viſcid matter, it may be removed by ſyringing, or even by inſtruments. We may eaſily aſcertain whether deafneſs be occaſioned by any external or internal cauſe, by putting a repeating watch into the perſon's mouth. If he hears it ſtrike, he may be aſſured that his deafneſs is effected by an external cauſe, and that it, in ſome meaſure, admits of a remedy.

I have often remarked, that men who have unmuſical ears, and bad voices, hear better with the one ear than with the other. I formerly obſerved, that ſquinting was occaſioned by an inequality of ſtrength in the eyes: A perſon who ſquints ſees not ſo far with the diſtorted eye as with the other. From this analogy I was led

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to make ſome experiments on men who ſung falſely; and I uniformly found that they heard better with the one ear than with the other. Through each ear they receive a different ſenſation, which produces a diſcordance in the total reſult; and thus, by always hearing falſe, they neceſſarily ſing falſe, without perceiving any defect. Perſons of this kind are likewiſe often deceived as to the quarter from which a ſound comes. If their beſt ear be the right one, ſounds will more frequently ſeem to proceed from the right than from the left. I ſpeak here of ſuch perſons only as are born with this imperfection; for, though a man advanced in life may, by accident, have one ear duller than another; yet, as he was formerly in the habit of receiving juſt perceptions of ſound, neither his ear nor his voice will be affected by the change.

Trumpets or funnels employed to aſſiſt the hearing, anſwer the ſame end as convex glaſſes to old or decayed eyes. The parts neceſſary to hearing, as well as thoſe neceſſary to viſion, become blunt and inſenſible with age; and, therefore, each of them equally requires the aſſiſtance of art to augment the quantity of the medium through which their peculiar ſenſations are tranſmitted. Trumpets for facilitating hearing might be rendered as extenſively uſeful to the ear, as teleſcopes are to the eye; but theſe trumpets could not be employed with advantage, except in ſolitary and ſilent places; for neighbouring

ſounds are uniformly collected and blended with thoſe at a diſtance, and produce in the ear nothing but a confuſed noiſe.

The ſenſe of hearing is of more importance to man than to any other animal. In the latter, it is only a paſſive quality of receiving impreſſions from diſtant objects; but, in man, it is not only a paſſive quality, but becomes active by the uſe of ſpeech. It is by this ſenſe that we are enabled to carry on the buſineſs of ſociety, and to form a mutual communication of our ſentiments. The organs of the voice would be entirely uſeleſs, if they were not excited to motion by the ſenſe of hearing. A man deaf from his birth is neceſſarily dumb, and has no idea of abſtract and general knowledge. We muſt not omit, in this place, a ſingular account of a man who, for the firſt time, ſuddenly acquired the uſe of hearing, when he was at the age of 24 years. His hiſtory, of which the following is an abridgement, is recorded in the Memoirs of the French Academy *.

'A young man, of the town of Chartres, 'aged about 24, who had been deaf from his 'birth, began, all at once, to ſpeak, to the utter 'aſtoniſhment of all who knew him. He informed his friends, that, for three or four 'months before, he had heard the ſound of 'bells; and that he was extremely ſurpriſed at 'this new and unknown ſenſation. Some time

* Année 1703, p. 18.

'after,

'after, a kind of humour iſſued from his left 'ear, and then he heard diſtinctly with both. 'During theſe three or four months, he liſtened 'to every thing; and, without attempting to 'ſpeak aloud, he accuſtomed himſelf to utter 'ſoftly the words ſpoken by others. He la-'boured hard in acquiring the pronunciation 'of words, and in learning the ideas annexed to 'them. At length, thinking himſelf qualified 'to break ſilence, he declared that he could 'ſpeak, though ſtill imperfectly. Soon after, 'he was interrogated by ſome able divines con-'cerning his former condition. The principal 'queſtions turned upon God, the ſoul, and 'moral good and evil. But of theſe ſubjects 'he ſeemed not to have the ſmalleſt concep-'tion. Though he was born of Catholic pa-'rents, attended maſs, was inſtructed to make 'the ſign of the croſs, and to aſſume all the 'external marks of devotion, he comprehend-'ed nothing of their real intention. He had 'formed no diſtinct idea of death; and exiſted 'purely in an animal ſtate. Wholly occupied 'with ſenſible objects, and with the few ideas 'he had acquired by the eye, he drew no con-'cluſions from them. He did not want parts; 'but the underſtanding of a man, when de-'prived of the intercourſe of ſociety, has ſo 'little exerciſe or cultivation, that he never 'thinks but when ſenſible objects obtrude them-'ſelves on his mind. The great ſource of

'human ideas arifes from the reciprocal inter-'courfe of fociety.'

It is poffible, however, to communicate ideas to deaf men, and to give them precife notions of general truths, by writing and by figns. A man deaf from his birth may be taught to read, to write, to communicate even the moft complicated ideas, and to underftand words by the motions of the lips. Nothing can be a ftronger proof of the great refemblance between the different fenfes, and how far one may fupply the place of another.

On this fubject, it may not be improper to relate a fact, of which I was an eye-witnefs. M. Rodrigue Pereire, a native of Portugal, having long ftudied the moft effectual methods of teaching the ufe of language to the deaf and dumb, brought a young man to my houfe, aged about 19, who had been deaf from his birth. M. Pereire undertook to learn him to fpeak, read, &c. At the end of four months, the young man could pronounce fyllables and words; and, after ten months, he knew, and could pronounce about 1300 words. His education, fo happily commenced, was interrupted, for nine months, by the abfence of his mafter, who then found that the young man had forgot a great part of what he had formerly learned. His pronunciation was extremely bad, and moft of his words had efcaped his memory. M. Pereire renewed his inftructions in the month of February

February 1748, and from that time has never left him, (June 1749). This young man was presented before one of the meetings of the French Academy, where several questions were put to him in writing. His replies, which he made both in writing and in words, were extremely distinct. But his pronunciation was slow, and the tone of his voice was harsh. These defects, however, were unavoidable; for it is by imitation alone that we bring our organs gradually to form precise and well articulated sounds: But a deaf man cannot imitate what he does not hear. The shortness of the time employed by the master, and the surprising progress of the pupil, who was not deficient in ability, fully evince that persons born deaf and dumb may, by the assistance of art, be taught to hold intercourse with society; for I am persuaded, that, if this man had begun to be instructed at the age of seven or eight, he would have attained as many ideas as mankind generally possess *.

* This conjecture is now fully verified by the labours of the ingenious Mr. BRAIDWOOD of Edinburgh, who has, for many years, taught, in his academy, great numbers of pupils, who had been born deaf, to speak, to read, to converse by observing the motions of other men's lips, and to understand grammar, morals, religion, and even the most abstract sciences.

SECT. VIII.

Of the Senses in general.

ANIMAL bodies are composed of different substances; some of which, as the bones, the fat, the blood, the lymph, &c. are insensible; and others, as the membranes and nerves, seem to be active substances, which give spring and vivacity to all the members. The nerves are the immediate instruments of feeling: Their nature, indeed, is diversified by a difference in their disposition: According to their arrangement, position, and quality, they convey to the mind different species of feeling, which have been distinguished by the name of *sensations*, and which seem, in effect, to have no resemblance to each other. If we consider, however, that all the external senses proceed solely from nervous expansions differently arranged and situated; that the nerves are the general organ of feeling; and that no other substance in the animal body is endowed with this faculty; we shall be inclined to believe, that the senses have one common origin, and that, as all nerves are only various forms of the

the ſame individual ſubſtance, the ſenſations which reſult from them differ not ſo eſſentially from each other as they at firſt appear.

The body of the eye is, perhaps, an expanſion of the optic nerve only. Its ſituation is more external than that of any other nerve; and it likewiſe conveys the moſt lively and the moſt delicate ſenſation. It muſt, therefore, be affected by the ſmalleſt particles of matter, as thoſe of light, and, of courſe, convey to the mind ſenſations of all diſtant bodies which either emit or reflect light. The ſituation of the ear is more internal than that of the eye; neither is it furniſhed with ſo large an expanſion of nervous ſubſtance, and muſt, of courſe, be endowed with a leſs degree of ſenſibility, and cannot be affected with particles of matter ſo minute as thoſe of light. But it is capable of being affected by groſſer particles; and it tranſmits to the mind ſenſations of ſuch diſtant bodies as are endowed with the faculty of putting theſe particles in motion. As theſe particles are groſſer, and have leſs velocity than thoſe of light, they can move a ſhort way only, and, conſequently, the ſenſations conveyed to us by the ear are much more limited, as to diſtance, than thoſe afforded by the eye. The membrane which is the ſeat of ſmell, is ſtill leſs ſupplied with nerves than the ear, and can give us ſenſations only by the intervention of particles of matter which are groſſer and nearer the organ, as thoſe that iſſue from odorous bodies. Theſe

particles

particles probably consist of the essential oils, which exhale and float in the air, as light bodies swim in water: And, as the nerves are still fewer and more divided on the tongue and palate, odoriferous particles are too weak to affect them. To produce the sensation of *taste*, the oily or saline parts must be detached from other bodies, and applied to the tongue. This sense differs greatly from that of smelling. The latter conveys sensations of bodies at a certain distance; but the former requires actual contact, and perhaps the solution of particular parts of bodies, as their salts, oils, &c. before any sensation is communicated. Lastly, as the nerves are minutely divided, and thinly spread over the skin, it cannot be affected by the particles of which light, sound, or odours, are composed. Nothing less than contact can give us the ideas which are proper to the sense of touching; and, of course, it conveys to us no information with regard to distant objects.

Hence the difference between the senses appears to proceed fom the situation of the nerves being more or less external, and from the greater or smaller quantity of them bestowed on the different organs. It is for this reason that a nerve, when irritated by a blow, or laid bare by a wound, frequently gives us the sensation of light without the intervention of the eye; and, from the same cause, we often feel the sensation

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of ſound, when the ear is not affected by any thing from without.

When the particles of light or of ſound are collected in great quantities, they form a kind of ſolid maſs, and produce ſenſations of different ſpecies, which ſeem to have no analogy with the original ſenſations: A very great aſſemblage of luminous particles affect not only the eyes, but the nerves of the ſkin, in which they excite the ſenſation of heat, which is a feeling different from that of viſion, though it be produced by the ſame cauſe. Heat, therefore, is a ſenſation proceeding from contact with light, which acts as a ſolid body, or as a maſs of matter in motion. This action of light, like other bodies in motion, is apparent when light ſubſtances are expoſed to the focus of a burning glaſs: Before they are heated, the action of the light communicates to them a motion, by which they are driven from their former ſtation. Here heat acts like ſolid bodies upon each other, ſince it is capable of diſplacing light ſubſtances, and of communicating to them a motion by actual impulſe.

In the ſame manner, when the particles of ſound are collected in great quantities, they produce a ſenſible agitation on the body, which is very different from the action of ſound on the ear. A violent exploſion, or a clap of thunder, produces a ſuccuſſion in us, and in every neighbouring body. Here ſound likewiſe acts as a

 ſolid

solid body. This tremulous motion is not occasioned by the agitation of the air; for we perceive not that it is accompanied with wind; and besides, even the strongest wind does not produce such violent concussions. It is owing to this action of the sonorous particles, that the vibrations excited in one string are communicated to the others; and the tremulous sensation we feel from a violent noise is very different from the sensation of sound in the ear, though it be an effect of the same cause.

All the varieties in our sensations proceed from the greater or lesser quantity of nerves, and from their position being more or less external. This is the reason why some of the senses, as the eye, the ear, the nose, are affected by the minute particles which issue from particular substances; and why others, as the senses of tasting and touching, require actual contact, or emanations of the grossest kind, by the latter of which we receive the sensations of the solidity, or fluidity, and of the heat of bodies.

A fluid differs from a solid, because its particles have no coherence, or are not gross enough to admit of being laid hold of on different sides at the same time. The particles of fluids touch one another but in one, or so few points, that none of them can have any great degree of adhesion with another. Solid bodies, even when reduced to an inpalpable powder, do not absolutely lose their solidity; because their particles,

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by touching each other in many points, ſtill preſerve a degree of coheſion; and this is the reaſon why we can ſqueeze them together, and form them into large tangible maſſes.

The ſenſe of feeling extends over the whole body; but its exertions are different in different parts. The ſenſation of touching is excited by the application of foreign bodies to ſome part of our own body. If a foreign body be applied to the breaſt or ſhoulders, we feel it; but we have no idea of its figure, becauſe the breaſt or ſhoulder touches the foreign body on one ſide only. The ſame remark is applicable to other parts which are incapable of folding round, or embracing at one time, ſeveral ſides of foreign bodies. The idea of figure can only be acquired by the flexible parts of the body, as the hands, which, from their ſtructure, are enabled to feel different parts of ſurfaces at the ſame time.

The hand is not the principal object of touch becauſe the extremities of the fingers are furniſhed with a great quantity of nervous papillæ, but becauſe it is divided into ſeveral parts, which are all flexible, all act at the ſame time, and are all obedient to the will. This alone is the ſource of all our ideas of figure and of magnitude. The ſurface of the hand and fingers is greater, in proportion, than any other part of the body, becauſe no other part is ſo much divided. This advantage, when joined to the flexibility of the fingers, renders the hand the moſt perfect inſtrument

ment for conveying ideas of the figures of bodies. If the hand were divided into 20 or more fingers, these ideas would be still more precise and exact; if, on the contrary, their present number were diminished, or if the hand were totally deprived of fingers, our ideas of figure would be very confused and indetermined.

Those animals which are furnished with hands appear to have most sagacity. Apes imitate the mechanical actions of man so completely, that they seem to be excited by the same sensations. But all animals which are deprived of hands can have no distinct idea of the figure or magnitude of objects; because none of their parts are sufficiently flexible and divided, to enable them to twist round the substances of bodies. This is the reason why animals are often terrified at objects which ought to be familiar to them. The muzzle is their principal organ of feeling, because it is divided into two parts by the mouth, and because the tongue serves both for touching bodies, and for turning them over, which they often do, before they seize them with their teeth. It is likewise probable, that animals which are furnished with many instruments of feeling, as the cuttle-fish, the polypus, and other insects, have a superior faculty of distinguishing and of choosing what is agreeable or convenient for them. Hence fishes whose bodies are covered with scales, ought to be the most stupid of animals, because they can have no knowledge of

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the form of objects; and a very obtuse sense of feeling must be conveyed through the scales. Hence also all animals which have not divided extremities, as arms, legs, paws, &c. must have a more obtuse sense of feeling than those that are furnished with these instruments of sensation. Serpents, however, are less stupid than fishes; because, though their skin is hard and scaly, they have the faculty of twisting round bodies, and of obtaining by this means more accurate conceptions of the forms and qualities of these bodies.

Thus the two chief obstacles to the exercise of the sense of feeling proceed, first, from the uniformity of the bodies of animals, or from their want of flexible and divided extremities; and, secondly, from the materials which cover the skin, as hair, feathers, scales, shells, &c. The harder and more solid this covering is, the sense of feeling will be less acute, and the finer and more delicate the skin, the sensation of feeling will be the more lively and exquisite. Women, among other advantages over the men, have a finer skin, and a more delicate perception of feeling.

The skin of a fœtus, while in the womb of the mother, is extremely delicate. It ought, therefore, to have a lively sense of external impressions. But, as it swims in a liquor, and as fluids blunt the action of every shock from without, the fœtus is rarely hurt, and never without some violence received by the mother.

Thus the ſenſe of feeling, though it depends on the fineneſs of the ſkin, and is extended over the whole body, can have little exerciſe in the fœtus-ſtate: A fœtus, therefore, though it may touch different parts of its own body with its hands, can have no diſtinct ſenſations ariſing from the ſenſe of feeling.

To a new-born infant, the hands are equally uſeleſs as they are to a fœtus; becauſe, by the abſurd practice of ſwaddling, they are not allowed to employ them during ſix or ſeven weeks after birth. The improvement of the ſenſe of feeling, from which we derive all our knowledge, is by this means unqueſtionably retarded. If a child had the free uſe of its hands the moment it came into the world, it would ſooner acquire ideas of the figure and magnitude of objects: And who can determine the influence which our firſt ideas have upon thoſe that are afterwards acquired? One man, perhaps, excels another in genius and ability, only becauſe he has been permitted, at a more early period, to make an unreſtrained uſe of the ſenſe of feeling. Infants, as ſoon as they are allowed to employ their hands, endeavour to touch every object they ſee. They delight in handling every thing they can ſeize: By feeling every part of bodies, they ſeem to be deſirous of acquiring exact ideas of their form. It is in this manner they amuſe, or rather inſtruct, themſelves with new objects: And this paſſion for novelty continues to be our amuſement during life.

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It is by the ſenſe of feeling alone that we acquire real knowledge. The innumerable errors into which we are led by the illuſions of the other ſenſes are corrected by feeling. But how is this important ſenſe originally unfolded? How do primary ideas arrive at the mind? Have we forgot every trace of what paſſes in the darkneſs of infancy? How ſhall we recal the firſt impreſſions of thought? Do not inquiries of this nature imply preſumption and temerity? If the ſubject were leſs momentous, we might be liable to cenſure. But the mind cannot, perhaps, be occupied with a ſubject more worthy of reſearch; and every effort ought to be exerted in the contemplation of great objects.

Let us ſuppoſe, then, a man in the ſame ſituation with him who firſt received exiſtence; a man whoſe organs were perfectly formed, but who was equally new to himſelf and to every external object which ſurrounded him: What would be this man's firſt ſenſations, and his firſt judgments concerning himſelf, and the objects of his ſenſations? Were he to give a hiſtory of his thoughts, and of the manner in which he received impreſſions, what information would he convey? To give perſpicuity to facts, I ſhall attempt to make him ſpeak for himſelf; and this ſhort philoſophical detail may not, perhaps, be an uſeleſs digreſſion.

I remember the moment when my exiſtence commenced: It was a moment replete with joy, amazement, and anxiety. I neither knew what I was, where I was, nor from whence I came. I opened my eyes; what an increaſe of ſenſation! The light, the celeſtial vault, the verdure of the earth, the tranſparency of the waters, gave animation to my ſpirits, and conveyed pleaſures which exceed the powers of expreſſion.

I at firſt believed that all theſe objects exiſted within me, and formed a part of myſelf. When totally abſorbed in this idea, I turned my eyes to the Sun: His ſplendor overpowered me. I involuntarily ſhut out the light, and felt a ſlight degree of pain. During this moment of darkneſs, I imagined that I had loſt the greateſt part of my being.

When reflecting, with grief and aſtoniſhment, upon this great change, I was rouſed with a variety of ſounds. The ſinging of birds, and the murmuring of the breezes, formed a concert, which excited the moſt ſweet and enchanting emotions. I liſtened long, and was convinced that theſe harmonious ſounds exiſted within me.

Totally occupied with this new ſpecies of exiſtence, I had already forgot the light, though the firſt part of my being that I had recogniſed. I again, by accident, opened my eyes, and was

delighted to find myself recover the possession of so many brilliant objects. This pleasure surpassed every former sensation, and suspended, for a time, the charming melody of sound.

I fixed my eyes on a thousand objects: I soon perceived that I had the power of losing and of recovering them, and that I could, at pleasure, destroy and renew this beautiful part of my existence.

I could now see without astonishment, and hear without anxiety, when a gentle breeze wafted perfumes to my nostrils. This new and delightful sensation, agitated my frame, and gave a fresh addition to my self-love.

When totally occupied by all these sensations, and loaded with pleasures so delicate and so extensive, I suddenly arose, and was transported by the perception of an unknown power.

I had made but a single step, when the novelty of my situation rendered me immoveable. My surprise was extreme. I thought my being fled from me: The movement I had made confounded the objects of vision; and the whole creation seemed to be disorder.

I raised my hand to my head; I touched my forehead and my eyes; and I felt every part of my body. The hand now appeared to be the principal organ of my existence. The perceptions afforded by this instrument were so distinct and so perfect; the pleasures conveyed by it were so superior to those of light and sound,

that, for ſome time, I attached myſelf entirely to this ſubſtantial part of my being, and I perceived that my ideas began to aſſume a conſiſtence and a reality which I had never before experienced. Every part of my body, which I touched with my hand, reflected the ſenſation, and produced in my mind a double idea.

By this exerciſe I ſoon learned, that the faculty of feeling was expanded over every part of my frame; and I began to recogniſe the limits of my exiſtence, which till now ſeemed to be of an immenſe extent.

I ſurveyed my body, and I judged it to be of a ſize ſo immenſe, that all other objects, in compariſon, ſeemed to be luminous points only. I followed my hand with my eyes, and obſerved all its motions. Of all theſe objects my ideas were confuſed and fallacious. I imagined that the motion of my hand was a kind of fugitive exiſtence, a mere ſucceſſion of ſimilar cauſes; I brought my hand near my eye; it then ſeemed to be larger than my whole body; for it concealed from my view almoſt every other object.

I began to ſuſpect that there was ſome illuſion in the ſenſation conveyed by the eyes. I diſtinctly perceived my hand was only a ſmall part of my body; but I was unable to comprehend how it ſhould appear ſo enormouſly large. I therefore reſolved to depend for information upon the ſenſe of feeling alone, which had never deceived me, and to be on

my guard againſt all the other modes of ſenſation.

This precaution was extremely uſeful to me. I renewed my motions, and walked with my face turned toward the heavens. I ſtruck againſt a palm tree, and felt a ſlight degree of pain. Seized with terror, I ventured to lay my hand upon the object, and diſcovered it to be a being diſtinct from myſelf, becauſe it gave me not, like touching my own body, a double ſenſation: I turned from it with horror, and perceived, for the firſt time, that there was ſomething external, ſomething which did not conſtitute a part of my own exiſtence.

It was with difficulty that I could reconcile myſelf to this diſcovery; but, after reflecting on the event which had happened, I concluded that I ought to judge concerning external objects in the ſame manner as I had judged concerning the parts of my body; and the ſenſe of feeling alone could aſcertain their exiſtence. I reſolved, therefore, to feel every object that I ſaw. I had a deſire of touching the Sun; I accordingly ſtretched forth my hands to embrace the heavens; but they met, without feeling any intermediate object.

Every experiment I made ſerved only to increaſe my aſtoniſhment; for all objects appeared to be equally near; and it was not till after an infinite number of trials, that I learned to uſe my eye as a guide to my hand. As the

hand

hand gave me ideas totally different from the impreſſions I received by the eye, my ſenſations were contradictory; the judgments I formed were imperfect; and my whole exiſtence was diſorder and confuſion.

Reflecting deeply on the nature of my being, the contradictions I had experienced filled me with humility: The more I meditated, my doubts and difficulties encreaſed. Fatigued with ſo many uncertainties, and with anxious emotions which ſucceſſively aroſe in my mind, my knees bended, and I ſoon found myſelf in a ſituation of repoſe. This ſtate of tranquillity added freſh force to my ſenſes. I was ſeated under the ſhade of a beautiful tree. Fruit of a vermilion hue hung down, in the form of grapes, within reach of my hand. Theſe fruits I gently touched, and they inſtantly ſeparated from the branch. In laying hold of one of them, I imagined I had made a great conqueſt; and I rejoiced in the faculty of containing in my hand an entire being which made no part of myſelf. Its weight, though trifling, ſeemed to be an animated reſiſtance, which I had a pleaſure in being able to conquer.

I held the fruit near my eye: I examined its form and its colours. A delicious odour allured me to bring it near my lips, and I inhaled long draughts of its perfumes. When entirely occupied with the ſweetneſs of its fragrance, my mouth opened, and I diſcovered that I had an

internal

internal ſenſe of ſmelling, which was more delicate and refined than that conveyed by the noſtrils. In fine, I taſted the fruit. The novelty of the ſenſation, and the exquiſiteneſs of the ſavour, filled me with aſtoniſhment and tranſport. Till now I had only enjoyed pleaſures; but taſte gave me an idea of voluptuouſneſs. The enjoyment was ſo congenial and intimate, that it conveyed to me the notion of poſſeſſion or property. I thought that the ſubſtance of the fruit had become part of my own, and that I was endowed with the power of transforming bodies.

Charmed with this idea of power, and with the pleaſures I felt, I continued to pull and to eat. But an agreeable languor gradually impaired my ſenſes; my limbs grew heavy; and my mind ſeemed to loſe its natural activity. I perceived this inaction by the feebleneſs of my thoughts: The dullneſs of my ſenſations rounded all external objects, and conveyed only weak and ill-defined ideas. At this inſtant my eyes ſhut, and my head reclined upon the graſs.

Every thing now diſappeared: Darkneſs and confuſion reigned. The train of my ideas was interrupted; and I loſt the conſciouſneſs of my exiſtence. My ſleep was profound; but, having no mode of meaſuring time, I knew nothing of its duration. My awakening appeared to be a ſecond birth; for I only perceived that I had ceaſed to exiſt. This temporary annihi-

lation

lation gave me the idea of fear, and made me conclude that my existence was not permanent.

Another perplexity arose: I suspected that sleep had robbed me of some part of my powers: I tried my different senses, and endeavoured to recognise all my former faculties. When surveying my body, in order to ascertain its identity, I was astonished to find at my side another form perfectly similar to my own! I conceived it to be another *self*; and, instead of losing by sleep, I imagined myself to be doubled.

I ventured to lay my hand upon this new being: With rapture and astonishment I perceived that it was not myself, but something much more glorious and desirable; and I imagined that my existence was about to dissolve, and to be wholly transfused into this second part of my being.

I perceived her to be animated by the touch of my hand: I saw her catch the expression in my eyes; and the lustre and vivacity of her own made a new source of life thrill in my veins. I ardently wished to transfer my whole being to her; and this wish completed my existence; for now I discovered a sixth sense.

At this instant the Sun had finished his course; I perceived, with [illegible]ain, that I lost the sense of seeing; my enj[illegible]ment was too exquisite to allow me to dre[illegible] an[illegible]ilation; and the present obscurity re[illegible]alled in vain the idea of my former sleep.

SECT. IX.

Of the Varieties of the Human Species.

WHAT we have hitherto remarked concerning the generation of man and the ſtructure of his body, conſtitutes the hiſtory of the individual only: That of the ſpecies requires a ſeparate detail, the principal facts of which muſt be collected from the varieties that appear among men in different regions of the earth. Theſe varieties may be reduced to three heads: 1. The colour; 2. The figure and ſtature; and, 3. The diſpoſitions of different people. Each of theſe heads, if extenſively conſidered, might afford materials for a volume; but we ſhall confine ourſelves to thoſe which are moſt general and beſt aſcertained.

With this view we ſhall ſurvey the ſurface of the earth, commencing with the northern regions.

In Lapland, and on the n[illegible]thern coaſts of Tartary, we find a race of men [illegible] ar[illegible]ncout[illegible] figure, and ſmall ſtature. Their co[illegible]enanc[illegible]s are equally ſavage as their manners. Th[illegible] men, who appe[illegible]r to be a degenerated ſpecies, are very numerous,

numerous, and occupy vaſt regions. The Daniſh, S…ediſh, and Muſcovite Laplanders, the inhabitants of Nova Zembla, the Borandians, the Samoiedes, the northern Tartars, the Oſtiacks of the Old Continent, and the Greenlanders and ſavages to the north of the Eſquimaux Indians in the New Continent, appear to be all the ſame race, who have extended and multiplied along the coaſts of the north ſea, in deſerts, and under climates which could not be inhabited by other nations. All theſe people have broad large faces *, and flat noſes. Their eyes are of a yellowiſh brown colour, inclining to black †; their eye-lids extend towards the temples ‡; their cheek-bones are very prominent; their mouths are large, and their lips thick and reflected; the under part of their face is narrow; they have a ſqueaking voice; the head is large, the hair black and ſmooth; and the ſkin is of a tawny or ſwarthy hue. Their ſize is diminutive; but, though meagre, their form is ſquat. Moſt of them are only four feet high; and their talleſt men exceed not four feet and a half. This race is ſo different from all others, that it ſeems to conſtitute a diſtinct ſpecies; for if there be among them a… …iſtinction, it ariſes only from a

* See … …ov… …le Regnard, tom. i. p. 169; Il Genio va…ante del … …e …no degli Anzi; et les Voyages du Nord …a… par … Hollandois.

† …e Linnæi Fauna Suecica, 1746, p. 1.

‡ See La Martiniere, p. 39.

greater

greater or leſs degree of deformity. The Borandians, for example, are ſtill leſs than the Laplanders. The iris of their eyes is of the ſame colour; but the white is of a reddiſh yellow: Their ſkin is more tawny; and their legs, inſtead of being ſlender, like thoſe of the Laplanders, are very thick and ſhapeleſs. The Samoiedes are more ſquat than the Laplanders; their heads are larger; their noſes are broader, and their complexion darker; their legs are ſhorter; their hair is longer, and their beards are more ſcanty. The ſkin of the Greenlander is more tawny than that of the other nations, being of a deep olive colour; and, it is ſaid, that ſome of them are as black as the Æthiopians. Among all theſe people, the women are fully as ugly as the men, whom they reſemble ſo much, that the diſtinction is not eaſily perceived. The women of Greenland are very ſhort; but their bodies are well proportioned. Their hair is blacker, and their ſkin ſofter than thoſe of the Samoiede females. Their breaſts are ſo long and pliable, that they can ſuckle their children over their ſhoulders. Their nipples are black as jet, and their ſkin is of a very deep olive colour. Some travellers alledge that theſe women have no hair but upon their heads, and that they are not ſubject to the menſtrual evacuations. Their viſage is lárge; their eyes ſmall, but black and lively; and their feet and hands are ſhort. In every other reſpect, they reſemble the Samoiede females.

females. The ſavages north of the Eſquimaux, and even in the northern parts of the Iſland of Newfoundland, have a great reſemblance to the Greenlanders. Like them their ſtature is ſmall, their faces broad, and their noſes flat; but their eyes are larger than thoſe of the Laplander.

Theſe people not only reſemble each other in deformity, in ſmallneſs of ſtature, and in the colour of their eyes and hair, but alſo in their diſpoſitions and manners: They are all equally groſs, ſuperſtitious, and ſtupid. The Daniſh Laplanders have a large black cat, to which they communicate their ſecrets, and conſult in all their important affairs; ſuch as, whether this day ſhould be employed in hunting or fiſhing. Among the Swediſh Laplanders, a drum is kept in every family for the purpoſe of conſulting the devil; and, though they are a robuſt and nimble people, ſuch is their puſillanimity, that they never could be perſuaded to face a field of battle. Guſtavus Adolphus endeavoured to embody a regiment of Laplanders; but he was obliged to relinquiſh the project. They cannot, it ſhould appear, exiſt but in their own country, and in their own manner. To enable them to travel on the ſnow, they uſe ſkates made of fir-wood, about two ells long, and half a foot broad. Theſe ſkates are raiſed before, with a hole in the middle for tying them firm on the foot. With theſe they run on the ſnow with ſuch rapidity, that they eaſily overtake the

ſwifteſt

ſwifteſt animals. They carry with them a pole pointed with iron at one end, and rounded at the other. This pole ſerves to puſh them along, to direct their courſe, to preſerve them from falling, to ſtop their impetuoſity, and to kill the animals they overtake. With theſe ſkates they deſcend the moſt frightful precipices, and climb the ſteepeſt and moſt rugged mountains. The ſkates uſed by the Samoiedes are ſhorter, and ſeldom exceed two feet in length. Among all theſe people, the women uſe ſkates as well as the men. They likewiſe employ the bow and the croſs-bow; and, it is ſaid, that the Muſcovite Laplanders dart a javelin with ſo much force and dexterity, that, at the diſtance of 30 paces, they are certain of hitting a mark not larger than a crown-piece; and that, at the ſame diſtance, they will transfix a human body. They hunt the ermine, the lynx, the fox, and the martin, and barter their ſkins for brandy and tobacco. Their food conſiſts principally of dried fiſh, and of the fleſh of the rein-deer and bear. Their bread is compoſed of the pounded bones of fiſhes, mixed with the tender bark of the pine, or birch tree. Moſt of them make no uſe of ſalt. Their uſual drink is whale-oil, or water in which juniper berries have been infuſed. They ſeem to have no idea of religion, or of a Supreme Being. They are moſtly idolaters, and exceedingly ſuperſtitious. More groſs than ſavages, they have neither courage, dignity, nor a ſenſe of ſhame.

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The manners of these abject people serve only to render them despicable. They bathe naked, and promiscuously, boys and girls, mothers and sons, brothers and sisters, without feeling the smallest sense of impropriety. When they come out of the baths, which are extremely warm, they immediately plunge themselves into cold rivers. They offer their wives and daughters to strangers, and esteem it the highest affront if the offer be rejected. This custom is universal among the Samoiedes, the Borandians, the Laplanders, and the inhabitants of Greenland. In winter, the Laplanders clothe themselves with the skin of the rein-deer, and, in summer, with the skins of birds. The use of linen is unknown to them. The women of Nova Zembla pierce their noses and their ears, and decorate them with pendants of blue stone; and, to increase their charms, they draw blue streaks across their forehead and chin. Their husbands cut their beards into a round form, and wear no hair on the head. The Greenland women clothe themselves with the skin of the dog-fish. They likewise paint their faces blue and yellow, and wear pendants in their ears. They all live under ground, or in huts almost sunk below the surface, and covered with the bark of trees, or bones of fishes. It is a common practice with them, during winter, to make subterraneous communications from hut to hut, by which they can visit their neighbours without going abroad.

A night,

A night, conſiſting of ſeveral months, obliges them to illuminate their dreary abodes with lamps, in which they burn the ſame whale-oil that ſerves them for drink. In ſummer, they have hardly more eaſe than in winter; for they are obliged to live perpetually in a thick ſmoke. This is the only means they have hitherto contrived to guard themſelves againſt the bite of the gnats, which are, perhaps, more numerous in this frozen country than in the Torrid Zone. Notwithſtanding this melancholy and hard mode of living, they are ſeldom or ever ſick, and all arrive at extreme old age. Even the old men are ſo vigorous, that it is difficult to diſtinguiſh them from the young. Blindneſs, which is very frequent among them, is the only malady to which they are ſubject. As their eyes are perpetually dazzled with the reflection from the ſnow in winter, autumn, and ſpring, and involved in ſmoke during ſummer, few of them retain their ſight after they are advanced in years.

It is therefore apparent, that the Samoiedes, the Zemblians, the Borandians, the Laplanders, the Greenlanders, and the ſavages to the north of the Eſquimaux, are the ſame race of men; becauſe they reſemble one another in figure, in ſtature, in colour, in manners, and even in ſingularity of cuſtoms. The cuſtom of offering their wives and daughters to ſtrangers, and of being vain when the offer is accepted, may pro-

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ceed from a ſenſe of their own deformity, as well as that of their females, whom they are apt to think the more handſome, becauſe they are deſpiſed by ſtrangers. At any rate, it is certain, that this practice is general among all theſe nations, though very diſtant from each other, and though ſeparated by a great ſea. We meet with it among the Crim Tartars, the Calmucs, and ſeveral other nations in Siberia and Tartary, who are almoſt equally ugly as the inhabitants of the more northern regions. In all the neighbouring nations, on the contrary, as China and Perſia*, where the women are beautiful, the men are remarkable for their jealouſy.

In examining the different nations adjacent to that vaſt tract of land occupied by the Laplanders, we find no relation between them and the race laſt mentioned. The Oſtiacks and Tonguſians, who border on the Samoiedes on the ſouth and ſouth-eaſt, are the only people who have any reſemblance to them. The Samoiedes and Borandians have no ſimilarity to the Ruſſians. The Laplanders reſemble not, in any manner, the Fins, the Goths, the Danes, or the Norwegians. The Greenlanders are totally different from the ſavages of Canada, who are large

* La Boulai informs us, that, after the death of the wives of the Schach, they conceal the place where they are interred; and that the ancient Egyptians would not embalm their wives till four or five days after their death, to prevent the ſurgeons from having any temptation; Voyage de la Boulaie, p. 110.

and

and well made; and, though the tribes differ from one another, yet none of them have any analogy to the Laplanders. The Ôſtiacks, however, ſeem to be a leſs ugly, and a talle[illegible]n of the Samoiedes *. They feed upon raw fleſh or fiſh; they eat all kinds of animals without diſtinction; they prefer blood to water for their drink; like the Laplanders and Samoiedes, they are moſtly idolaters; in a word, they appear to be the line which divides the Lapponian and Tartarian races; or, rather, the Laplanders, the Samoiedes, the Borandians, the Nova Zemblians, and perhaps the Greenlanders, and the Dwarfs of North America, may be conſidered as Tartars reduced to the loweſt degree of degeneracy. The Tonguſians ſeem to be leſs degenerated than the Oſtiacks; becauſe the former, though ſufficiently ugly, are taller, and better proportioned. The Samoiedes and Laplanders lie under the 68th or 69th degree of latitude, but the Oſtiacks under the 60th. The Tartars, who are ſituated along the Wolga, in the latitude of 55, are groſs, ſtupid, and brutal. Like the Tonguſians, they have no idea of religion; and they will not marry girls till they have had intercourſe with other men.

The Tartars occupy immenſe regions in Aſia. They ſpread over that vaſt tract of country extending from Ruſſia to Kamtſchatka, a ſpace of

* See le Voyage de Evertiſbrand, p. 212, &c. and les Nouveaux Memoirs ſur l'Etat de la Ruſſie, tom. i. p. 270.

11 or 12 hundred leagues in length, by more than 750 in breadth, which is a territory above 20 times larger than the kingdom of France. The Tartars border with China, the kingdoms of Boutan, and of Alva, and the Mogul and Perſian empires, as far as the Caſpian Sea, on the north and weſt. They ſpread along the Wolga and the weſt coaſt of the Caſpian, as far as Dagheſtan; they have penetrated to the north coaſt of the Black Sea, and have eſtabliſhments in Crimea, in Little Tartary near Moldavia, and in the Ukraine. All theſe people, even in their youth, have large wrinkled foreheads; their noſes are thick and ſhort, and their eyes ſmall and ſunk *; their cheek-bones are very high, and the lower part of their face is very narrow; their chin is long and prominent, and the upper jaw falls in; the teeth are long and diſtinct from each other; the eye-brows are thick, and cover the eyes; the face is flat; the ſkin is tawny or olive; and the hair is black. Their bodies are of a middle ſtature, but ſtrong and robuſt. They have little beard, and the hairs are diſpoſed in tufts, like the beards of the Chineſe. Their thighs are thick, and their legs ſhort. The Calmuck Tartars are the moſt ugly; there is even ſomething frightful in their countenance. They are all wandering vagabonds, living in tents made of cloth or of ſkins. They eat the

* See les Voyages de Rubruſquis, de Marc Paule, de Jean Struys, du Pere Avril, &c.

fleſh

flesh of horses, and of other animals, either raw, or a little softened, by putrifying under their saddles, and likewise fishes dried with the sun. Their common drink is mares milk fermented with the flour of millet. They all shave the head, except a little tuft which they allow to grow, in order to form two tresses, one of them to hang on each side of the face. The women, who are as ugly as the men, wear their hair, in which they fix little pieces of copper, and other ornaments of the same nature.

In most of these tribes, no marks of religion, or of decency in their manners, are to be found. They are all robbers; and the Tartars of Daghestan, who border on civilized nations, have a great trade in slaves, whom they carry off by force, and then sell them to the Turks and Persians. Their wealth consists chiefly of horses, which are, perhaps, more numerous in Tartary than in any other country on the globe. These people live perpetually with their horses, and are continually occupied in training, dressing, and exercising them. They manage their horses with such address, that a stranger would imagine both creatures to be animated with the same mind. These horses not only obey the gentlest motions of the bridle, but they seem to know the very intention of their riders.

To learn the particular differences which subsist among the race of Tartars, we have only to compare the descriptions given by travellers of

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their different tribes. We are informed by Tavernier, that the Calmucks, who live in the neighbourhood of the Caſpian Sea, between Muſcovy an[illegible]at Tartary, are robuſt men, but the moſt ugly and deformed beings under heaven. Their faces are ſo large and ſo flat, that their eyes, which are generally ſmall, are ſituated five or ſix inches aſunder. Their noſes are ſo low, that, inſtead of noſtrils, two holes are only to be ſeen; and their knees bend outward, and their legs inward. After the Calmucks, the Tartars of Dagheſtan hold the next rank in deformity. The Little Tartars, or thoſe of Nogai, who live near the Black Sea, are not ſo ugly as the Calmucks, though they have flat faces, and ſmall eyes, and reſemble the Calmucks in their general figure. By their intercourſe with the Circaſſians, the Moldavians, and other adjoining nations, this race of Tartars have perhaps loſt a part of their original deformity. The Tartars of Siberia, though, like the Calmucks, they have broad faces, ſhort flat noſes, and ſmall eyes, and though their language be very different, there is ſtill ſo great a ſimilarity between them, that they ought to be regarded as the ſame race of people. The Tartars of Bratſki are conſidered by Père Avril as of the ſame race with the Calmucks; and, in proportion as we advance eaſtward, and approach Independent Tartary, the features of the Tartars gradually ſoften; but the characters eſſential to their race are never obliterated. Laſtly, the Mongou-

Mongou-Tartars, who conquered China, and were the moſt poliſhed, though their features be leſs diſagreeable, yet, like all the other tribes, they have ſmall eyes, large flat faces, thin black or red beards *, ſhort ſunk noſes, and a tawny complexion. The people of Thibet, and of the other ſouthern provinces of Tartary, are alſo leſs deformed. Mr. Sanchez, firſt phyſician to the Ruſſian army, a man of great learning and ability, has obliged me with the following remarks made by him in travelling through Tartary.

In the years 1735, 1736, and 1737, he viſited the Ukraine, the banks of the Don as far as the ſea of Zabach, and the confines of Cuban, as far as Aſoph. He traverſed the deſerts which lie between the country of the Crims and Backmut. He journeyed among the wandering Calmucks from the kingdom of Caſan to the banks of the Don, among the Tartars of Crimea and Nogai, who wander between the Crimea and the Ukraine, and likewiſe among the Tartars of Kergiſſi and Tcheremiſſi, who are ſituated to the north of Aſtracan, from the 50th to the 60th degree of latitude. He remarked, that the Tartars of Crimea and of the province of Cuban, were of a middle ſtature; and that they had broad ſhoulders, narrow flanks, ſtrong nervous limbs, black eyes, and a tawny complexion. The Tartars of Kergiſſi and Tcheremiſſi are ſmaller and more ſquat; they are groſſer, and leſs agile;

* Palafox, p. 444.

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they have black eyes, a tawny hue, and faces ftill broader than the former. He obferved, among thefe Tartars, feveral men and women who had no refemblance to them, and of whom fome were as white as the inhabitants of Poland. As thefe nations abound with flaves, both male and female, who are carried off from Ruffia and Poland; as their religion permits a plurality of wives and concubines; and as their Sultans, Murzas, or Nobles, bring their wives from Circaffia and Georgia, the children who fpring from fuch alliances are lefs deformed, and whiter than thofe of the unmixed natives. There are even among the Tartars a whole nation, that of the Kabardinfki, who are remarkably beautiful. M. Sanchez faw no lefs than 300 of thefe men in the Ruffian fervice; and he affures us, that he never faw men make a more handfome figure. Their countenances were as frefh and white as any in Europe; they had large black eyes; and they were tall and well proportioned. He adds, that the Lieutenant-General of Serapikin, who had lived long in Kabarda, informed him, that the women were equally beautiful. But this nation, fo totally different from the other Tartar tribes with which they are furrounded, continued M. Sanchez, are faid to have come originally from the Ukraine, and had been tranfported into Kabarda about 150 years ago.

The blood of the Tartars is mixed on one fide with the Chinefe, and, on the other, with the

 oriental

oriental Ruſſians. But the characteriſtic features of the race are not entirely obliterated by this mixture; for, among the Muſcovites, the Tartarian aſpect is very frequent; and, though the former have ſprung from the common European race, we ſtill find many individuals with ſquat bodies, thick thighs, and ſhort legs, like the Tartars. But the Chineſe have ſo great a reſemblance to the Tartars, that it is uncertain whether they be not of the very ſame race: The moſt remarkable difference ariſes from a total diſparity in their diſpoſitions, manners, and cuſtoms. The Tartars are fierce, warlike, and fond of hunting. They love fatigue and independence; and they are hardy and brutally groſs. But the manners of the Chineſe are the very reverſe. They are effeminate, peaceable, indolent, ſuperſtitious, ſubmiſſive, ceremonious, and paraſitical. In their features and form, however, they have a great reſemblance to the Tartars.

The Chineſe, ſays Hugon, are large and fat men, with well-proportioned limbs, round broad faces, ſmall eyes, large eye-brows, high eye-lids, and ſmall ſunk noſes. They have only ſeven or eight tufts of hair on each lip, and very little on the chin. Thoſe who live in the ſouthern provinces are browner and more tawny than thoſe in the northern parts; and their colour reſembles that of the people of Mauritania, or the more ſwarthy of the Spaniards: But, in the

middle provinces, they are as white as the Germans. According to Dampier and others, they are not all large and fat, though they regard these properties as great ornaments to the human figure. Speaking of the inhabitants of the island of St. John, on the coast of China, Dampier informs us, that they are tall, erect, and not incumbered with fat; that they have a long visage and a high forehead; that their eyes are small, their nose pretty large and elevated in the middle, their mouth of a moderate size, their lips thin, their complexion ash-coloured, and their hair black; that they have naturally little beard; and that they pull out all the hairs, except a few on the chin and upper lip. According to Gentil, the Chinese have nothing disagreeable in their aspect, especially in the northern provinces: Those whom necessity exposes to the sun, in the southern provinces, are tawny. In general, they have small oval eyes, short noses, and thick bodies of a middle stature. He assures us, that the women use every art to diminish their eyes; and that the young girls, instructed by their mothers, continually extend their eye-lids, in order to make their eyes small and oblong, which, when joined to a flat nose, and large, open, pendulous ears, constitute a perfect beauty. He adds, that their complexion is fine, their lips of a beautiful red, their mouths well-shaped, and their hair exceedingly black; but that the chewing of betle blackens their teeth, and their constant

ſtant uſe of paint ſo greatly injures their ſkin, that they have the appearance of old age before they arrive at 30 years.

We are aſſured by Palafox, that the Chineſe are whiter than the oriental Tartars; that they have alſo leſs beard; but that, in every other reſpect, there is little difference in the viſages of theſe two nations. It is very uncommon, he ſays, to ſee blue eyes either in China or the Philippine Iſlands, except the Europeans, or thoſe born of European parents.

It is alledged by Innigo Biervillas, that the women of China are better made than the men. The faces of the latter, he obſerves, are large, and their complexions yellowiſh; their noſes are broad and compreſſed; and their bodies are thick and coarſe like thoſe of Dutchmen: The women, on the contrary, are exceedingly handſome; their ſkin and complexion are admirably fine; and their eyes are extremely beautiful: But few of them, he adds, have good noſes, becauſe they are purpoſely compreſſed in their infancy.

Moſt of the Dutch voyagers agree that the Chineſe, in general, have broad faces, ſmall eyes, flat noſes, and hardly any beard; that the natives of Canton, and all along the ſouthern coaſt, are as tawny as the inhabitants of Fez in Africa; but that thoſe of the interior provinces are moſtly white. Now, if we compare the deſcriptions of the Tartars and Chineſe given by the diffe-

rent authors above quoted, we cannot hesitate in pronouncing, that the Chinese, though they differ a little in their stature, and in the form of their countenance, have a greater relation to the Tartars than any other people, and that all the differences between them proceed entirely from climate and the mixture of races. This is the opinion of Chardin: 'The size of the 'Little Tartars,' he remarks, 'is about four 'inches less than that of the Europeans; and 'they are thicker in the same proportion. 'Their complexion is copper-coloured; their 'faces are broad, flat, and square; their noses 'are compressed, and their eyes small. Now, 'these are the exact features of the Chinese; 'for, after the most minute examination, dur-'ing my travels, I found that all the people, 'to the east and north of the Caspian Sea, and 'to the east of the Peninsula of Malacca, have 'the same configuration of face, and nearly 'the same stature. From this circumstance, I 'was induced to think, that all these people, 'notwithstanding the varieties in their manners 'and complexion, sprung from the same source; 'for differences in colour proceed entirely from 'climate and the manner of living; and varie-'ties in manners originate from the soil, and 'from the degrees of opulence enjoyed by dif-'ferent nations *.'

* See Chardin, tom. iii. p. 96.

Father

Father Parennin, who lived long in China, and accurately obſerved the manners of that people, informs us, that the neighbouring nations in the weſt, from Thibet northward to Chamo, differed from the Chineſe in manners, language, features, and external conformation; that they are a rude, ignorant, ſlothful people, faults very uncommon among the inhabitants of China; that, when any of theſe Tartars come to Pekin, and the Chineſe are aſked the reaſon of theſe differences, they anſwer that they are occaſioned by the water and the ſoil; or, in other words, that the nature of the country produces theſe changes in the bodies and di[illegible] of its inhabitants. He adds, that this remark ſeems to be more verified in China than in any other country he ever ſaw; and that, when following the Emperor in a journey to Tartary, as far as the 48th degree of north latitude, he found Chineſe families from Nankin, who had ſettled there, whoſe children had become perfect Mongous, having their heads ſunk between their ſhoulders, crooked legs, and an aſpect that was truly groſs and diſguſting *.

The Japaneſe are ſo very ſimilar to the Chineſe, that they may be regarded as the ſame race of men; their colour is indeed darker, becauſe they live in a more ſouthern climate. In general, their complexion is vigorous; their ſtature ſhort; their face and noſe broad and flat; their

* See Recueil 24. des Lettres edifiantes.

eyes

eyes ſmall; their beard thin; and their hair black. They are haughty, warlike, full of vigour and dexterity, civil and obliging, ſmooth-tongued, and abound in compliments; but they are a vain and inconſtant people. They ſuſtain, with incredible patience, hunger, thirſt, cold, heat, fatigue, and all the other hardſhips of life. Like the Chineſe, they eat their meat with ſmall ſticks, and, during their meals, they uſe a multitude of ceremonies and ſtrange grimaces. They are laborious, ſkilful artificers; and, in a word, their diſpoſitions, manners, and cuſtoms, are nearly the ſame with thoſe of the Chineſe.

The abſurd cuſtom of rendering the feet of their women ſo ſmall that they can hardly ſupport their bodies, is common to both nations. Some travellers affirm, that, when the Chineſe girls arrive at three years of age, their feet are bended in ſuch a manner, that the toes lie under the ſole; that they apply aquafortis to burn off the fleſh; and then wrap them up in ſtrong bandages. They add, that the women feel the conſequences of this operation all their lives; for they walk with much difficulty, and their gait is exceedingly ungraceful. They chearfully ſubmit, however, to this inconveniency; and, as it is a mean of pleaſing, they endeavour to make their feet as ſmall as poſſible. Other travellers deny that they break the feet, and alledge, that they only compreſs them ſo forcibly as to prevent their growth: But all agree, that

every woman of fashion, and every woman that is reckoned handsome, must have her feet so small that they could enter with ease into the shoe of a child of six years of age.

We may, therefore, upon the whole, conclude, that the Japanese and Chinese are the same race of people; that their civilization is of a very ancient date; and that they differ more from the Tartars in their manners than in their figure. Their early civilization may be ascribed to the fertility of the soil, the mildness of the climate, and the vicinity of the sea; while the Tartars, removed from the sea, and separated from the southern nations by high mountains, have continued to wander in their vast deserts, and under a climate, the rigour of which, especially in the northern parts of Tartary, could only be supported by a robust and uncultivated people. The country of Jesso, which lies to the north of Japan, though situated under a climate which ought to be temperate, is, however, cold, barren, and mountainous: Its inhabitants are also totally different from those of China and Japan. They are a gross brutal race, having neither manners nor arts. Their bodies are thick and short; their hair is long and bristly; their eyes are black; their forehead is flat, and their colour yellow, though less so than that of the Japanese. Their faces, as well as their whole body, are very hairy. They live like savages, and their food consists of the fat and oil of whales, and

other fiſhes. They are exceedingly indolent, and ſlovenly in their dreſs. Their children go almoſt naked; and the women have invented no other ornament but that of painting their eye-brows and lips of a blue colour. The ſole pleaſure and occupation of the men is hunting bears and rein-deer, and fiſhing whales. Though they have ſome Japaneſe cuſtoms, as that of ſinging with a quavering voice, yet, in general, they have a greater reſemblance to the northern Tartars, or the Samoiedes, than to the natives of Japan.

In examining the people on the ſouth and weſt of China, we find that the Cochin-chineſe, who inhabit a mountainous region that lies ſouth of China, are more tawny and more ugly than the Chineſe; and that the Tonquineſe, whoſe country is more fertile, and who live under a colder climate than the Cochin-chineſe, are more handſome and beautiful. Dampier tells us, that the Tonquineſe are of a middle ſtature; and that, though their complexion be tawny, their ſkin is ſo ſmooth and delicate, that the ſmalleſt changes from redneſs to paleneſs are perceptible in their faces, a circumſtance which diſtinguiſhes them from the other Indians. Their viſage is generally flat and oval, their noſe and lips well proportioned, their hair black, long, and very thick; and they uſe every art to make their teeth black. According to the relations annexed to Tavernier's voyages, the Tonquineſe are

of a good ſtature, and of an olive colour. They have not the flat faces and noſes of the Chineſe; and they are, in general, much handſomer.

Thus, it appears, that theſe nations differ little from the Chineſe: In colour they reſemble the inhabitants of the ſouthern provinces of China. If they are more tawny, it is owing to their living under a warmer climate; and, though their faces and noſes be more prominent, they may ſtill be regarded as people ſprung from the ſame origin.

The ſame obſervation is applicable to the natives of Siam, of Pegu, of Aracan, of Laos, &c. The features of all theſe nations have a ſtriking reſemblance to thoſe of the Chineſe; and, though they differ from the Chineſe in colour, yet they differ much more from the other Indians. The ſtature of the Siameſe, according to Loubère, is rather ſmall; their bodies are well made; their faces are large, and their cheek-bones prominent; their forehead ſuddenly contracts, and terminates in a point, like the chin; their eyes are ſmall and oblique; the white of the eye is yellowiſh; the cheeks are hollow, from the elevation of the upper part of the cheek-bones; the mouth is large, the lips thick, and the teeth black; their complexion is coarſe, being a mixture of brown and red, or, according to other travellers, of an aſh-colour, which is, perhaps, as much owing to the perpetual ſultrineſs of the air, as to their birth: Their noſe is ſhort, and

rounded

rounded at the point; their ears are naturally large, and are much efteemed when their fize is remarkably great. This tafte for long ears is common to all the eaftern nations. Some draw the lob of the ear in order to lengthen it, and pierce it fo as only to allow the admiffion of an ordinary pendant; and others, as the natives of Laos, widen the holes in their ears fo prodigioufly, that they will almoft admit a man's hand; and, by this means, their ears defcend to the top of their fhoulders. With regard to the Siamefe, however, their ears are naturally a little larger than ours. Their hair is coarfe, black, and ftraight; and it is worn fo fhort, both by the men and the women, that it reaches no lower than the ear all round the head. They anoint their lips with a kind of perfumed pomatum, which makes them appear unnaturally pale. They have little beard; and they always pull out the hairs: Nor is it cuftomary to pare their nails, &c. Struys informs us, that the women of Siam wear pendants in their ears, fo large and heavy, that the holes gradually grow wide enough to admit a thumb. He adds, that the colour of both men and women is tawny; that, though not tall, they are handfome; and that, in general, the Siamefe are a mild and polifhed people. Father Tachard remarks, that the Siamefe are very alert, and have among them dancers and tumblers as agile as thofe in Europe. He tells us, that the cuftom of black-

ening

ening their teeth proceeds from a notion they entertain of its being unſeemly for men to have white teeth like the brutes. They beſmear them with black varniſh, and abſtain three or four days from meat, in order to make it adhere the more firmly.

The inhabitants of the kingdoms of Pegu and Aracan differ not from thoſe of China and Siam, except in their colour, which is a little blacker*. The natives of Aracan are fond of large flat foreheads; and, to render them ſo, they apply a plate of lead to the foreheads of their children immediately after birth. They have large open noſtrils, ſmall ſparkling eyes, and ears ſo long that they reſt upon their ſhoulders. They eat, without diſguſt, mice, rats, ſerpents, and putrified fiſh †. Their women are tolerably fair, and their ears are equally long as thoſe of the men ‡. The people of Achen, who are ſtill farther north than thoſe of Aracan, have likewiſe flat viſages, and olive complexions. They are exceedingly groſs, and allow their boys to go quite naked; and the girls have only a thin plate of ſilver to ſave their bluſhes ‖.

All theſe nations, it is apparent, differ little from the Chineſe, and reſemble the Tartars in the ſmallneſs of their eyes, their flat viſages, and their olive colour. But, in proceeding ſouth-

* See Pigafetta, p. 46.

† See Voyages de Ovington, tom. ii. p. 274.

‡ See le Recueil des Voyages de la Compagnie Hollandoiſe, tom. vi. p. 251.

‖ Ibid. tom. iv. p. 63. and le Voyage de Mandelſlo tom. ii. p. 328.

ward, the features begin to be diverſified in a more ſenſible manner. The inhabitants of Malacca, and of the iſland of Sumatra, are black, ſmall, active, and well proportioned. Though naked from the middle upwards, except a ſmall ſcarf which they carry ſometimes on one ſhoulder and ſometimes on the other *, they are naturally brave, and become formidable after taking their opium, which affects them with a kind of furious intoxication †. The inhabitants of Sumatra and of Malacca, according to Dampier, are of the ſame race. They ſpeak nearly the ſame language; they have all a fierce and haughty temper; their ſtature is of a middle ſize; they have a long viſage, black eyes, noſes of a moderate bulk, thin lips, and teeth dyed black by the frequent uſe of betle ‡. In the iſland of Pugniatan, or Piſſagan, about 16 leagues weſt of Sumatra, the natives are tall, and of a yellow colour, like the Braſilians. They wear long ſmooth hair, and go abſolutely naked ‖. Thoſe of the iſlands of Nicobar, to the north of Sumatra, are of a yellowiſh tawny complexion, and likewiſe go perfectly naked §. Dampier tells us, that the natives of the Nicobar iſlands are tall and handſome; that their viſage is long, their hair black and ſmooth, and their noſes of a moderate ſize; and that the women tear out

* See les Voyages de Gherardini, p. 46. † See les Lettres Edifiantes, Recueil ii. p. 60. ‡ See Dampier, tom. iii. p. 156. ‖ See Recueil de la Comp. de Holl. tom. i. p. 281. § See Lettres Edifiantes, Recueil ii. p. 172.

the hairs from their eye-brows, &c. The natives of the iſland of Sombrero, to the north of Nicobar, are very black; and they paint their faces with different colours, as green, yellow, &c.*. The people of Malacca, of Sumatra, and of the ſmall adjacent iſlands, though they differ between themſelves, differ ſtill more from the Chineſe, Tartars, &c. and ſeem to have originated from a different race; yet the natives of Java, who are in the neighbourhood of thoſe of Sumatra and Malacca, have no reſemblance to them, but are ſimilar to the Chineſe, except in colour, which, like that of the Malays, is red mingled with black. They likewiſe reſemble, ſays Pigafetta †, the natives of Brazil; their complexion is coarſe, and, though neither remarkably large nor ſmall, they are ſquat, and exceedingly muſcular; their faces are flat, their cheeks flabby and pendulous; their eye-brows large, and inclined to the temples; their eyes ſmall, and their beards very black and thin. Father Tachard remarks, that the people of Java are robuſt and handſome; that they ſeem to be active and reſolute; and that the extreme heat of the climate obliges them to go naked. From the Lettres Edifiantes ‡, it appears, that the natives of Java are neither black nor white, but of a purpliſh red colour; and that they are mild, familiar, and courteous.

* See l'Hiſt. Gen. des Voyag. tom. i. p. 387. † See Indiæ Orientalis, par. i. p. 51. ‡ Recueil xvi. p. 13.

Francis

Francis Legat relates, that the women of Java, who are not expoſed to the rays of the ſun, are leſs tawny than the men; that their countenance is comely, their breaſts prominent and well ſhaped, and their complexion, though brown, uniform and beautiful; that they have a delicate hand, a ſoft air, brilliant eyes, an agreeable ſmile; and that many of them dance with great elegance and ſpirit*. Moſt of the Dutch voyagers agree, that the natives of this iſland are robuſt, well made, and nervous; that their viſage is flat, their cheeks broad and prominent, their eye-lids large, their eyes ſmall, their hair long, and their complexion tawny; that they have little beard; that they wear their hair and nails very long; and that they poliſh their teeth with files †. In a little iſland fronting that of Java, the women are tawny, have ſmall eyes, a large mouth, flat noſes, and long black hair ‡.

From all theſe relations, we may conclude, that the inhabitants of Java greatly reſemble the Tartars and Chineſe, while thoſe of Malacca, Sumatra, and the ſmall adjacent iſlands, differ from the Chineſe, both in their features and in the form of their bodies. Neither is it difficult to account for this phænomenon; for the peninſula of Malacca, the iſlands of Sumatra and Java, as

* See les Voyages de Franc. Legat. tom. ii. p. 130.

† See Recueil des Voyages de la Comp. Holl. tom. i. p. 392. and Mandelſlo, tom. ii. p. 344.

‡ See Voyages de Gentil tom. iii. p. 92.

 well

well as all the other iſlands in the Indian Archipelago, muſt have been peopled by the neighbouring nations on the continent, and even the Europeans themſelves, who have had poſſeſſion of them near three centuries. This circumſtance muſt have produced a great variety among the inhabitants, as well in the features and colour, as in the form and proportions of their bodies. In the iſland of Java, for example, there are a people called *Chacrelas*, who are totally different, not only from the natives of this iſland, but from all the other Indians. Theſe Chacrelas are white and fair; and their eyes are ſo weak, that they cannot ſupport the rays of the ſun. They go about, in the day, with their eyes half ſhut, and directed to the ground; but they ſee beſt during the night*. All the inhabitants of the Molucca iſlands, ſays Pyrard, are ſimilar to thoſe of Sumatra and Java, in manners, mode of living, arms, cuſtoms, language, colour, &c.†. We learn from Mandelſlo, that the men are rather black than tawny, and that the women are fairer; that their hair is black; that their eyes, eye-brows, and eye-lids, are large; that their bodies are ſtrong and robuſt; that they are dexterous and agile; and that they live long, though their hair ſoon becomes hoary. This traveller likewiſe tells us, that each iſland has its own peculiar language, and that they have pro-

* See les Voyages [illegible]egat. tom. ii. p. 137.

† See les Voyages de [illegible] tom. ii. p. 178.

bably

bably been peopled by different nations *. The inhabitants of Borneo and of Bali, he adds, are rather black than tawny †; but, according to other travellers, they are only brown, like the other Indians ‡. Gemelli Carreri ſays, that the inhabitants of Ternate are of the ſame colour with the Malays, which is a little darker than thoſe of the Philippine iſlands; that their countenances are comely; that the men are handſomer than the women; and that both ſexes beſtow much care on their hair ‖. The Dutch travellers relate, that the natives of the iſland of Banda are remarkable for longevity; that they have ſeen a man aged 130, and many who approached to that uncommon period of life; that theſe iſlanders are, in general, exceedingly indolent; that the men do nothing but ſaunter abroad; and that all the laborious offices are executed by the women §. According to Dampier, the original natives of the iſland of Timor, which is one of thoſe moſt adjacent to New Holland, are of a middle ſtature: They have erect bodies, delicate limbs, a long viſage, black briſtly hair, and a very black ſkin: They are dexterous and agile, but indolent to a ſhameful degree **. In another place, however, he ſays, that the inha-

* See Voyages de Mandelſlo, tom. ii. p. 378.
† Ibid. tom. ii. p. 363. ‡ See Recueil des Voyages de la Comp. de Holl. tom. ii. p. 120. ‖ See les Voyages de Gemelli Carreri, tom. v. p. 224. § See les Voyages de la Comp. de Hol[illegible] tom. i. [illegible] 566. ** See les Voyages de Dampier, tom. [illegible]

bitants

bitants along the bay of Laphao are moſtly tawny and of a copper colour, and that their hair is black and flat*.

Turning northward, we find Manilla and the other Philippine iſlands, the inhabitants of which, by alliances formed between the Spaniards, the Indians, the Chineſe, the Malabars, the Negroes, &c. are perhaps more mixed than thoſe of any other part of the univerſe. Thoſe Negroes, who live in the rocks and woods of Manilla, are entirely different from the other inhabitants. Some of them have criſped hair, like the Negroes of Angola, and others long hair; their colour conſiſts of various ſhades of black. Among theſe, ſome have been ſeen who had *tails* four or five inches long, like the iſlanders mentioned by Ptolemy†. This traveller adds, that he was informed by Jeſuites worthy of credit, that, in the iſland of Mindora, which is adjacent to Manilla, there is a race of men called *Manghians*, who have all tails of the ſame length; that ſome of theſe tailed men had even embraced the Catholic faith‡; and that they had olive complexions and long hair‖. Dampier tells us, that the inhabitants of the iſland of Mindanao, which is one of the principal and moſt ſoutherly of the Philippines, are of a middle ſtature; that their limbs are ſlender, their bodies thin and ſtraight, their viſages oval, their foreheads flat, their eyes

* See les Voyages de Dampier, tom. i. p. 52.

† See les Voyages de Gemelli Carreri, tom. v. p. 68.

‡ Ibid. tom. v. p. 92. ‖ Ibid. tom. v. p. 298.

 black

black and ſmall, their noſes ſhort, their mouths large, their lips thin and red, their teeth black, their hair ſmooth and black, their colour tawny and more yellow than ſeveral of the other Indian tribes; that the women are handſome and fairer than the men; that their viſage is longer, and their features ſufficiently regular, except the noſe, which is ſhort and flat; that their limbs are ſmall, and their hair long and black; and that the men, in general, are alert and ingenious, but ſlothful and addicted to robbery. We learn from the Lettres Edifiantes, that the inhabitants of the Philippine Iſlands reſemble the Malays, who formerly conquered theſe iſlands; that, like them, the noſe is ſhort, the eyes large, the complexion of a yellowiſh olive colour, and that their cuſtoms and language are nearly the ſame.

To the north of Manilla lies the iſland of Formoſa, which is not far diſtant from the province of Fokien in China. But theſe iſlanders have no reſemblance to the Chineſe. Struys informs us, that the men of this iſland are of ſmall ſtature, particularly thoſe who live in the mountains; that they have flat faces; that the women have coarſe full breaſts, and a beard like the men; that their ears are long, and their length is increaſed by heavy ſhells which they employ for pendants; that their hair is black and long, and their complexion of a yellowiſh black colour; that ſome of them are of a whitiſh yellow,

low, and others entirely yellow; that they are extremely indolent, dexterous in managing the bow and the javelin, excellent ſwimmers, and run with incredible ſwiftneſs. Struys expreſsly declares, that, in this iſland, he ſaw a man with a tail more than a foot long, covered with reddiſh hair, and not unlike that of an ox; and that this tailed man aſſured him, that the tail was a conſequence of the climate, for all the natives of the ſouthern part of the iſland had tails of the ſame kind*.

I know not what credit is due to this relation of Struys: If the fact concerning the tails be true, it muſt be exaggerated; for it accords not with the accounts of other travellers, nor even with that of Ptolemy; and Marc Paul, in his Geographical Deſcription, ſays, that, in the mountains, and in the kingdom of Lambry, there are men with tails about a palm long only. It appears, that Struys reſts upon the authority of Marc Paul, as Gemelli Carreri does upon that of Ptolemy; and that the tail he pretends to have ſeen is very different in its dimenſions from that aſcribed by other travellers to the Negroes of Manilla, the inhabitants of Lambry, &c.

The editor of the Memoirs of Pſalmanazar, concerning the iſland of Formoſa, makes no mention of theſe extraordinary men; but he remarks, that, though it be extremely warm in this iſland, the women are very fair and handſome, particularly thoſe of them who are not

* See les Voyages de Struys, tom. i. p. 100.

expoſed

exposed to the rays of the sun; that they anxiously preserve their complexion by the use of certain lotions; that they are equally attentive to the beauty of their teeth, and, instead of painting them black, like the Chinese and Japanese, they use every art to preserve their whiteness; that the men are not tall, but thick and strong; and that they are, in general, vigorous, indefatigable, good soldiers, very dexterous*, &c.

The Dutch voyagers, in their accounts of the natives of Formosa, differ from all those we have hitherto mentioned. Mandelslo, as well as the writers of the collection of voyages which paved the way for the establishment of the Dutch East India Company, inform us, that these islanders are taller than the Europeans; that their colour is brownish black; that their bodies are hairy; and that the women are of a low stature, but robust, fat, and tolerably proportioned. In most of the writers concerning this island, there is no mention of men with tails; and they differ widely from each other in their descriptions of the form and features of the natives. But, with regard to one fact, which is no less extraordinary, they seem entirely to agree, namely, that the women are not permitted to bear children till the age of 3[illegible], though they are at liberty to marry long before that period. Speaking of this custom,

* See la Description de l'Isle Formose, dressée sur le Memoires de George Psalmanazar, par le Sieur N. F. D. B. R. p. 103.

The Count de Buffon seems not to have known that Psalmanazar was an impostor, and his book a mere fiction, otherwise he would never have quoted him as an author of credit.

Rec[illegible]teren

Rechteren expresses himself in the following terms: 'After marriage, the women are not allowed to be mothers till they have completed their 35th or 37th year. When they are pregnant before this period, their priestesses trample with their feet upon the women's bellies, and in this manner force them to miscarry, an operation much more painful and dangerous than a natural labour: But it is disgraceful, and even a high crime, to allow a child to come into the world before the age prescribed. I have seen women who had 16 of these forced miscarriages, and were only permitted to bring forth their seventeenth child *.'

The Mariana or Ladrone islands, which are the most remote from the eastern coast, are inhabited by a rude and unpolished people. Father Gobien tells us, that, till the arrival of the Europeans, they had never seen fire, and that they were extremely surprised when this element was first exhibited to them by Magellan. Their colour is tawny, though somewhat fairer than that of the natives of the Philippines; they are stronger and more robust than the Europeans; they are tall and well-proportioned: Though they feed solely on roots, fruits, and fish, yet they are fat and corpulent; but their corpulency prevents them not from being nimble and active. They live so long, that the

* See les Voyages de Rechteren dans le Recueil de Voyages de la Comp. de Holl. tom. v. p. 96.

age

age of 100 years is not extraordinary among them, without ever experiencing diſeaſe or ſickneſs*. We are told by Gemelli Carreri, that the natives of theſe iſlands are of a gigantic ſize, and that they are ſo ſtrong, that they can with eaſe carry on their ſhoulders a weight of 500 pounds†. In general, their hair is criſped‡, their noſe and eyes are large, and their complexion is like that of the Indians. The inhabitants of Guan, one of theſe iſlands, have long black hair, a large noſe, thick lips, white teeth, a long viſage, a ferocious aſpect; they are likewiſe exceedingly robuſt; and their ſtature, it is ſaid, extends to ſeven feet in height‖.

To the ſouth of the Mariana iſlands, and eaſtward of the Moluccas, we find the land of the Papous and New Guiney, which ſeem to be the moſt ſoutherly regions of the globe. According to Argenſola, the Papous are as black as the Caffres, have criſped hair, and a meagre and diſagreeable viſage: Among theſe people, however, there are ſome who are as white and fair as the Germans; but their eyes are weak and delicate§. We are alſo informed by Le Maire, that the natives of this country are very black, ſavage, and brutal. They wear rings in their

* See l'Hiſt. des Iſles Marianes, par le P. Gobien.

† See les Voyages de Gemelli Carreri, tom. v. p. 298.

‡ See Lettres Edifiantes, Recueil xviii. p. 198.

‖ See Dampier, tom. i. p. 378. and alſo Cowley's Voyage round the World.

§ See l'Hiſt. de la Conquête des Iſles Moluques, tom. i. p. 148.

ears

ears and noſes, and ſometimes in the partition of the noſe. They likewiſe wear bracelets of mother of pearl above the elbows and on the wriſts, and they cover their heads with caps made of the bark of trees, painted with different colours. They are ſtrong and well-proportioned, have black teeth, a pretty good beard, and black and criſped hair, though not ſo woolly as that of the Negroes. They are ſwift in the chace; and, as the uſe of iron is unknown to them, their weapons conſiſt of clubs, lances, and ſpears, made of hard wood. They likewiſe uſe their teeth as offenſive weapons, and bite like dogs. They eat betle and pimento mixed with chalk, which alſo ſerves them for powder to their beards and hair. Their women have a diſguſtful aſpect: They have long breaſts which hang down to the navel, very prominent bellies, ſmall arms and limbs, the viſage of an ape, and hideous features*. Dampier tells us, that the natives of the iſland of Sabala, in New Guiney, are a kind of tawny Indians, with long black hair, and who differ not in manners from thoſe of the iſland of Mindanao, and of the other eaſtern iſles; that, beſide theſe, who appear to be the principal inhabitants of New Guiney, there are alſo Negroes with frizzled woolly hair †. Speaking of another of theſe iſlands, called *Garret-Denys*, our author remarks, that the inhabitants

* See la Navigation auſtrale de Jacques le Maire, and les Voyages de la Comp. de Holl. tom. iv. p. 648.

† See Dampier, tom. v. p. 82.

are

are black, robuſt, and well made; that they have large round heads, and ſhort criſped hair, which they cut in different faſhions, and paint with various colours, as red, white, and yellow; that they have large round faces, and broad and flat noſes; that their countenances, however, would not be abſolutely diſguſting, if they did not thruſt through their noſtrils a kind of peg, about an inch thick and four inches long, ſo that each end of it reſts upon their cheek-bones, and only a ſmall part of the noſe appears around this unnatural ornament; and that they wear ſimilar pegs in their ears*.

The natives of the coaſt of New Holland, which is ſituated in the 16th degree of ſouth latitude, and beyond the iſland of Timor, are perhaps the moſt miſerable of the human ſpecies, and approach neareſt to the brutes. They are tall, erect, and thin; their limbs are long and ſlender; they have large heads, a round forehead, and thick eye-brows: Their eye-lids are always half-ſhut, a habit which they contract in infancy, to protect their eyes from the gnats; and, as they never open their eyes, they cannot ſee at a diſtance, without raiſing their heads as if they were looking at ſomething above them. They have thick noſes and lips, and large mouths: They pull out, it ſhould appear, the two fore-teeth of the upper jaw; for, in neither ſex, nor at any period of life, are theſe teeth to

* See Dampier, p. 102.

be

be ſeen. They have no beard; their viſage is long, without a ſingle feature that is agreeable; their hair is ſhort, black, and criſped; and their ſkin is as black as that of the Guiney Negroes. They have no cloathing but a piece of the bark of a tree tied round their waiſt, with a handful of long herbs in the middle. They have no houſes, and they ſleep on the ground without any covering. They aſſociate, men, women, and children, promiſcuouſly, to the number of 20 or 30. Their only nouriſhment is a ſmall fiſh, which they catch in reſervoirs made with ſtones in ſmall arms of the ſea; and they are totally unacquainted with bread, and every ſpecies of grain*.

In another part of the coaſt of New Holland, about the 22d or 23d degree of ſouth latitude, the natives ſeem to be of the ſame race with thoſe we have now deſcribed. They are extremely ugly and diſguſting, and have the ſame defect in their eyes; their ſkin is black, their hair criſped, and their bodies are tall and ſlender†.

From theſe deſcriptions, it is apparent, that the iſlands and coaſts of the Indian ocean are peopled with men of very different races. The natives of Malacca, of Sumatra, and of the Nicobar iſlands, ſeem to derive their origin from the inhabitants of the peninſula of Indus; and thoſe of Java from the Chineſe, except the

* See Dampier, tom. ii. p. 171.

† Ibid. tom. iv. p. 13.

white

white men called *Chacrelas*, who muſt have ſprung from the Europeans. The natives of the Molucca iſlands ſeem alſo, in general, to have proceeded from the Indian peninſula. But the inhabitants of the iſland of Timor, which lies neareſt to New Holland, are very ſimilar to the people of that country. Thoſe of Formoſa, and of the Mariana iſlands, reſemble each other in ſtature, ſtrength, and features; and they appear to form a race entirely diſtinct from every other people in the neighbourhood. The Papous, and other nations adjacent to New Guiney, are real Negroes, and reſemble thoſe of Africa, though they are ſeparated from that continent by a tract of ſea more than 2200 leagues over. The natives of New Holland have a ſtrong analogy to the Hottentots. But, before drawing any concluſions from all theſe relations and differences, it is neceſſary to examine the condition of the nations of Aſia and Africa.

The Moguls, and other natives of the peninſula of India, nearly reſemble the Europeans in traits and features; but they differ more or leſs from them in colour. The Moguls are olive, though, in the Indian language, *Mogul* ſignifies *white*. The women are extremely handſome, and make frequent uſe of bathing. Like the men, they are of an olive colour, and, what is oppoſite to the women of Europe, their legs and thighs are long, and their bodies ſhort*. Tavernier

* See les Voyages de la Boulaie le Gouz, p. 153.

vernier ſays, that, after paſſing Lahor, and the kingdom of Caſhmire, the Mogul women have naturally no hair on any part of the body, and that the men have very little beard *. According to Thevenot †, the Mogul women are chaſte, very fruitful, and bring forth with ſo much eaſe, that they frequently walk the ſtreets the very next day after delivery. He adds, that, in the kingdom of Decan, the men marry at ten, and the women at the age of eight years, and that they have often children at this early period; but the women who have children ſo ſoon, commonly ceaſe to bear after the age of 30, when they are wrinkled, and have all the appearances of decrepitude. Some of theſe women have their ſkin punctured in the form of flowers, and painted with the juices of plants, which gives the ſkin the appearance of being ſtuffed with flowers ‡.

The natives of Bengal are yellower than the Moguls; their manners are alſo totally different: Their women, inſtead of being chaſte, are ſuppoſed to be the moſt laſcivious in India. A great ſlave-trade, both of males and females, is carried on in this country; and a number of eunuchs are made, both by a ſimple privation of the teſticles, and by a total amputation of the parts. The Bengalians are handſome and beautiful;

* See Voyages de Tavernier, tom. iii. p. 80.

† Tom. iii. p. 246.

‡ Tavernier, tom. iii. p. 34.

they love commerce, and have a great deal of mildneſs in their manners *.

The natives of the Coromandel coaſt are blacker than thoſe of Bengal; they are alſo leſs civilized, and go almoſt naked. Thoſe of the Malabar coaſt are ſtill blacker. They have very long, ſmooth, black hair, and are of the ſame ſize with the Europeans. The women wear gold rings in their noſes; and the men, women, and young girls, bathe promiſcuouſly in ponds made for the purpoſe in the middle of their towns. The women, though black, or at leaſt exceedingly brown, are comely and handſome, and they marry at the age of eight years †.

The cuſtoms of the different Indian nations are all very ſingular, if not whimſical. The Banians eat nothing that is animated; they even dread to kill the ſmalleſt inſect, and will not deſtroy the louſe that bites them. They throw rice and beans into the rivers, to nouriſh the fiſhes, and grain upon the ground, to feed the birds and inſects. When they meet a hunter or a fiſher, they earneſtly beg of him to deſiſt: If he be deaf to their entreaties, they offer him money for his gun or net; and, if he does not comply, they trouble the waters to frighten the fiſhes, and ſet up hideous cries, to put the birds and other game to flight ‡.

* See Voyages de Pyrard, p. 34.

† See Recueil des Voyages, tom. vi. p. 461.

‡ See Voyages de Struys, tom. ii p. 225.

The Naires of Calicut form a band of nobles, whose only profession is that of arms. These men, though of an olive colour, are comely and handsome. They are tall and hardy, full of courage, and very dexterous in the management of their weapons. They lengthen their ears to such a pitch, that they hang down on their shoulders, and sometimes lower. These Naires are allowed only one wife; but the women may have as many husbands as they please. Father Tachard, in his letter to Father la Chaise, dated at Pondicherry February 16, 1702, tells us, that, in the cast or class of nobles, a woman sometimes has ten husbands, whom they regard as slaves subjected to their beauty. This privilege is confined to ladies of rank; for the women of inferior condition are allowed but one husband: The latter, indeed, take care to alleviate this hardship by their commerce with strangers, to whose embraces they abandon themselves without reserve; and their husbands dare not challenge them. The mothers prostitute their daughters even before they arrive at a proper age. The Naires or nobles of Calicut seem to be of a different race from the burgesses; for the latter, both males and females, are of a smaller stature, and are worse shaped, and more ugly *. Among the Naires there are some men, as well as women, whose legs are as thick as the body of an ordinary man. This deformity is not a conse-

* See Pyrard, p. 411.

quence

quence of diſeaſe; for they have it from their birth. In ſome, this monſtrous thickneſs is confined to one leg only. The ſkin of theſe legs is hard and rough, like a wart: Notwithſtanding this cumberſome deformity, the perſons affected with it are nimble and active. This race of men with thick legs have not multiplied greatly, either among the Naires or the other Indians. They, however, appear in other places, and eſpecially in Ceylon *, where they are ſaid to be of the race of St. Thomas.

The natives of Ceylon are ſimilar to thoſe of the Malabar coaſt. Though they are not equally black †, they have large ears which hang down to their ſhoulders. Their aſpect is mild; and they are naturally alert, dexterous, and vivacious. Their hair, which is very black, is worn ſhort by the men. The common people go almoſt naked; and the women, according to a cuſtom pretty general in India, have their boſoms uncovered ‡. In the northern part of the iſland of Ceylon, there is a ſpecies of ſavages called *Bedas*, who occupy only a ſmall diſtrict, and ſeem to be of a peculiar race. The ſpot they inhabit is entirely covered with wood, in which they conceal themſelves ſo cloſely, that it is difficult to diſcover any of them. Their complexion is

* See Pyrard, p. 416. See alſo Recueil des Voyages de la Comp. de Holl. tom. iv. p. 362. † See Pigafettæ Ind. Orient. par. i. p. 39. ‡ See Recueil des Voyages, &c. tom. vii. p. 19.

fair, and ſometimes red, like that of the Europeans. Their language has no analogy to any of the other Indian languages. They have no villages or houſes, and hold no intercourſe with the reſt of mankind. Their arms conſiſt of bows and arrows, with which they kill a number of boars, ſtags, and other animals. They never dreſs their meat; but they ſeaſon it with honey, with which they are plentifully provided. We are ignorant of the origin of this tribe, who are not numerous, and who live in detached families *. Theſe Bedas of Ceylon, as well as the Chacrelas of Java, who are both fair and few in number, appear to be of European extraction. It is probable, that ſome European men and women have been formerly left on theſe iſlands by ſhipwreck, or otherwiſe, and that, for fear of being maltreated by the natives, they and their deſcendants confined themſelves to the woody and mountainous parts of the country, where they continue to live a ſavage life, which, perhaps, wants not its charms to thoſe who are accuſtomed to ſuch a mode of living.

The natives of the Maldiva iſlands are ſuppoſed to have deſcended from thoſe of Ceylon, though there is no reſemblance between them: For the natives of Ceylon are black and deformed; but thoſe of the Maldiva iſlands are handſome, and, except their olive colour, differ little from the Europeans; beſides, they are a

* See l'Hiſt. de Ceylon, par Ribeyro, p. 177.

people composed of all nations. The inhabitants of the northern parts of these islands are more civilized than those who inhabit the southern parts. The women, notwithstanding their olive colour, are beautiful, and some of them are as fair as the Europeans. Their hair is universally black, which they regard as a beauty, and studiously render the hair black, by shaving the heads of their boys and girls every eight days, till they arrive at the age of nine or ten. This practice, it is probable, contributes to blacken the hair; for, though every man and woman has black hair, that of their children is sometimes pretty fair. Another beauty among the women is to have their hair very long and very thick, and, for this purpose, they anoint their head and body with a perfumed oil. The men are more hairy than those of Europe. These islanders love exercise, and are industrious artists; they are superstitious, and much addicted to venery; though the women carefully conceal their bosoms, they are exceedingly indolent and debauched; they perpetually eat betle and other hot spices. As to the men, they are less vigorous than their spouses would incline *.

The natives of Cambai are more or less of an ash-colour; and those who live near the sea are more swarthy than the others †. Those of

* See les Voyages de Pyrard, p. 120. et 324.

† See Pigafettæ Ind. Orient. par. i. p. 34.

Guzarat

Guzarat are yellow *; and the Canarins, or the inhabitants of Goa and of the neighbouring iſlands, are olive †.

We are informed by the Dutch voyagers, that the natives of Guzarat are more or leſs yellow; that their ſtature is the ſame with the Europeans; that the women, who ſeldom expoſe themſelves to the ſun, are fairer than the men, and that ſome of them are nearly as white as the Portugueſe ‡.

Mandelſlo ſays, that the inhabitants of Guzarat are all more or leſs tawny, or olive, according to the climate under which they live; that the men are ſtrong and well made, and have large faces and black eyes; that the women are little, but handſome; and that they wear long hair, pegs in their noſes, and large pendants in their ears §. There are very few deformed perſons among them; ſome of them are fairer than others, but all have black ſtraight hair. The ancient inhabitants of Guzarat are eaſily diſtinguiſhed from the others by their colour, which is much blacker; they are likewiſe more barbarous and ſtupid ‖.

Goa is the principal ſettlement of the Portugueſe in India; and, though its ancient ſplendour is much decayed, it ſtill continues to be an

* See Voyages de la Bouſaye le Gouz, p. 225.

† Id. ibid. ‡ See Recueil des Voyages, &c. tom. vi. p. 405. § See Mandelſlo, p. 195. ‖ Ibid. tom. i. p. 222.

opulent and commercial city. It was formerly the greateſt market for ſlaves in the whole world. Handſome women and girls were ſold here from every nation of Aſia. Theſe ſlaves were of all colours; and they were ſkilled in muſic, and in every ſpecies of ſewing and embroidery. The Indians were moſt enamoured with the Caffre girls from Moſambique, who are all black. 'It 'is remarkable,' ſays Pyrard, 'that the ſweat 'of the Indians, whether male or female, has 'no unſavoury odour, while the ſtench of the 'African negroes, when they are over-heated, 'is perfectly inſupportable.' He adds, that the Indian women are fond of the European men, and prefer them even to the white Indians *.

The Perſians are adjacent to the Moguls, and have a great reſemblance to them; thoſe eſpecially who inhabit the ſouthern parts of Perſia differ very little from the Indians. The natives of Ormus, and of the provinces of Baſcia and Balaſcia, are very brown and tawny; thoſe of Cheſmur, and of the other provinces of Perſia, where the heat is not ſo great as at Ormus, are fairer; and thoſe of the northern provinces are tolerably white †. According to the Dutch travellers, the women in the iſlands of the Gulf of Perſia are brown or yellow, and not at all agreeable. They have a large viſage, and

* See Pyrard, tom. ii. p. 64.

† See la Deſcription des Provinces Orientales par Marc Paul, p. 22, 39. and Pyrard, tom. ii. p. 256.

ugly

ugly eyes. In ſome of their manners and cuſtoms, they reſemble the Indian women, as thoſe of wearing rings in the cartilage of the noſe, and of paſſing a gold pin through the ſkin of the noſe, near the eyes *. Indeed, this cuſtom of piercing the noſe for the purpoſe of embelliſhing it with rings and other trinkets, has extended much farther than the Gulf of Perſia; many of the Arabian women wear rings in their noſes; and it is a piece of gallantry among the men to ſalute their wives through theſe rings, which are ſometimes ſo large, that they encircle the whole mouth †.

Xenophon ſays, that the Perſians were generally thick and fat. Marcellinus, on the contrary, tells us, that, in his time, they were thin and meagre. Olearius agrees with the laſt author, and adds, that they are ſtrong and hardy; and that they are of an olive colour, and have black hair and aquiline noſes ‡.

That the blood of the Perſians, ſays Chardin, is naturally groſs, appears from the Guebres, who are a remnant of the ancient Perſians, and are an ugly, ill made, rough ſkinned people. This is alſo apparent from the inhabitants of the provinces in the neighbourhood of India, who are nearly as clumſy and deformed as the Gue-

* See Recueil des Voyages de la Comp. de Holl. tom. v. p. 191. † See le Voyage fait par ordre du Roi dans la Paleſtine, par M. D. L. R. p. 260. ‡ See Voyage d'Olearius, tom. i. p. 501.

bres,

bres, because they never form alliances with any other tribes. But, in the other parts of the kingdom, the Persian blood is now highly refined by frequent intermixtures with the Georgians and Circassians, two nations who surpass all the world in personal beauty. There is hardly a man of rank in Persia who is not born of a Georgian or Circassian mother; and even the King himself is commonly sprung, on the female side, from one or other of these countries: As it is long since this mixture commenced, the Persian women have become very handsome and beautiful, though they do not rival the ladies of Georgia. The men are generally tall and erect; their complexion is ruddy and vigorous, and they have a graceful air, and an engaging deportment. The mildness of the climate, joined to their temperance in living, have a great influence in improving their personal beauty. This quality they inherit not from their fathers; for, without the mixture mentioned above, the men of rank in Persia, who are descendants of the Tartars, would be extremely ugly and deformed. The Persians, on the contrary, are refined and ingenious; their imagination is lively and fertile; though warlike, they are lovers of the arts and sciences; they are vain, and extremely ambitious of praise; their temper is soft and ductile; they are voluptuous, and much addicted to gallantry and intrigue; they are luxurious and prodigal, and equally

equally ſtrangers to œconomy and to commerce *.

The Perſians, though in general pretty ſober, devour vaſt quantities of fruit. Nothing is more common than to ſee a man eat 12 pounds of melons; ſome will devour three or four times that quantity; and many of them fall a ſacrifice to this exceſſive appetite for fruit †.

Fine women, of all complexions, are common in Perſia; for they are ſelected by the merchants, from every country, on account of their beauty. The white women are brought from Poland, from Muſcovy, from Circaſſia, from Georgia, and from the frontiers of Great Tartary: The tawny women are tranſported from the Mogul's dominions, and from the kingdoms of Golconda and Viſapore, and the blacks from Melinda and the coaſts of the Red Sea ‡. A ſtrange ſuperſtition prevails among the inferior claſs of women. Thoſe who are barren, imagine paſſing under the dead bodies of ſuſpended criminals will render them fruitful; they even believe that the influence of a male corpſe, though at a diſtance, is ſufficient to impregnate them.

When this abſurd remedy does not ſucceed, they go into the canals of water which run from the baths, when they know that many men are employed in bathing themſelves; and, if this

* See Chardin, tom. ii. p. 34. † See les Voyages de Thevenot, tom. ii. p. 181. ‡ See les Voyages de Tavernier, tom. ii p. 368.

ſpecific

ſpecific be equally unſucceſsful as the former, their laſt reſource is to ſwallow that part of the prepuce which is cut off in the operation of circumciſion, which they conſider as a ſovereign remedy againſt ſterility *.

The inhabitants of Perſia, of Turkey, of Arabia, of Egypt, and of all Barbary, may be regarded as the ſame race of people, who, in the time of Mahomet and his ſucceſſors, extended their dominions by invading immenſe territories, and became exceedingly diverſified by intermixing with the original natives of all theſe different countries. The Perſians, the Turks, and the Moors, have acquired a degree of civilization: But the Arabs have generally continued in a ſtate of lawleſs independency. Like the Tartars, they live without government, without law, and almoſt without ſociety. Rape, theft, and robbery, are authoriſed by their chiefs. They glory in their vices, and have no regard to virtue; and they deſpiſe every human inſtitution, except thoſe only which produce ſuperſtition and fanaticiſm.

The Arabs, however, are enured to labour. They likewiſe accuſtom their horſes to undergo the greateſt fatigue, and allow them to drink only once in 24 hours. Their horſes are meagre, but ſwift, and almoſt indefatigable. Theſe people live in extreme miſery. They have neither bread nor wine; neither do they take the trou-

* See les Voyages de Gemelli Carreri, tom. ii. p. 200.

ble

ble of cultivating the ground. In place of bread, they uſe ſome wild grain, which they mix and knead with the milk of their cattle *. They have flocks of camels, ſheep, and goats, which they conduct from place to place till they find ſufficient herbage for them: Here they erect their tents, which are made of goats hair, and live with their wives and children till the graſs is conſumed; they then decamp, and go in queſt of another fertile ſpot †. Though their mode of living be hard, and their food extremely ſimple, the Arabs are ſtrong and robuſt; even their ſtature is not ſmall, and they are pretty handſome. But their ſkin is ſcorched with the heat of the ſun; for moſt of them go either entirely naked, or are covered only with a tattered ſhirt ‡. Thoſe who live on the coaſts of Arabia Felix, and of the iſland of Socotora, are of ſmaller ſtature; their complexion is aſh-coloured or tawny, and in the form of their bodies they have a great reſemblance to the Abyſſinians ‖. The Arabs paint their arms, their lips, and the moſt conſpicuous parts of their body, of a deep blue colour. This paint, which they lay on in ſmall dots, and make it penetrate the fleſh by means of a needle made for the purpoſe, can never be effaced §. This ſingular cuſtom prevails like-

* See les Voyages de Villamon, p. 603. † See les Voyages de Thevenot, tom. i. p. 330. ‡ Voyages de Villamon, p. 604. ‖ See Pigafettæ Ind. Orient. par. i. p. 25. and Olearius, tom. ii. p. 100. § Voyages de Pietro della Valle, tom. ii. p. 269.

wiſe

wife among the Negroes who trade with the Mahometans.

Among the Arabs who live in the deferts on the frontiers of Tremefen and Tunis, the girls, to improve their beauty, paint their bodies with cyphers of a blue colour, which they accomplifh by means of vitriol and the point of a lancet. In this they are followed by the country Africans, but not by thofe that live in towns; for there they preferve the fame colour they bring with them into the world. Some of them, indeed, paint a fmall flower on their cheek, their forehead, or their chin, with the fmoke of galls and faffron, which makes a fine black colour: They likewife blacken their eye-brows *. La Boulaye informs us, that the Arabian women of the Defert paint their hands, lips, and chin, of a blue colour; that moft of them wear rings of gold or filver, about three inches diameter, in their nofes; that, though they are born fair, their complexions are fpoilt by being continually expofed to the fun; that the young girls are extremely agreeable, and fing perpetually; but their fongs are not melancholy and plaintive, like thofe of the Turks, but have a ftill ftranger effect, becaufe they raife their voice to the higheft pitch, and articulate with great rapidity †.

'The Arabian princeffes and ladies,' another traveller remarks, 'whom I was permitted to

* See L'Afrique de Marmol, tom. i. p. 88.

† Voyages de la Boulaye le Gouz. p. 318.

5 'fee,

'ſee, were extremely handſome, beautiful, and 'fair, becauſe they are always covered from the 'rays of the ſun. But the common women, be-'ſide their natural tawny complexion, are very 'much blackened by the ſun; their form is ex-'ceedingly diſagreeable, and, except thoſe natu-'ral attractions which always accompany youth, 'I could never perceive any thing in their ap-'pearance that could pleaſe the fancy. Theſe 'women puncture their lips with needles, and 'cover them with gunpowder and the gall of 'oxes, which penetrate the ſkin, and render 'their lips blue and livid during life. They 'practiſe the ſame art upon the angles of the 'mouth, on each ſide of the chin, and upon the 'cheeks. They blacken the eye-lids with a 'black powder, and draw a black line from the 'corner of each eye, in order to make them ap-'pear more expanded; for the chief beauty of 'the eaſtern women conſiſts in large prominent 'eyes. Female beauty among the Arabs is ex-'preſſed by ſaying, That ſhe has the eyes of 'the antelope. They always compare their 'miſtreſſes to this ſprightly animal; and black 'eyes, and the eyes of the antelope, are the 'principal topics of their love ſongs. The an-'telope is indeed a moſt beautiful and hand-'ſome creature, and has in its aſpect a certain 'degree of innocent timidity, which reſembles, 'in a ſtriking manner, the modeſty and appre-'henſion natural to young women. The ladies 'and new married wives blacken their eye-brows,

'and make them join in the middle of the 'forehead. They puncture their arms and 'hands, and form upon them the figures of 'animals, flowers, &c. and paint their nails of 'a reddish colour: The men also paint their 'hair and the tails of their horses with the same 'colour. The women pierce their ears in se- 'veral places, for the purpose of hanging rings 'and broaches to them, and they also wear 'bracelets on their arms and legs *.' To this account it may be added, that the Arabs are exceedingly jealous of their wives; and that, though they either purchase them, or carry them off by force, they treat them with gentleness, and even with respect.

The Egyptians, though adjacent to the Arabs, and though governed by the same laws, and professing the same religion, are very different in their manners and customs. In all the towns and villages along the Nile, for example, we find young girls destined by the public to the pleasure of travellers, without any obligation to pay for this indulgence. For this species of hospitality, they have houses filled with these girls; and it is a pious practice with rich men, when about to die, to found and endow houses for this charitable purpose. When any of these young women bring forth male children, the mothers are obliged to rear them to the age of three or four years; after which the children

* See le Voyage fait par ordre du Roi dans la Palestine, par M. D. L. R. p. 260.

are

are carried to the patron of the houſe, or his repreſentatives, who then take charge of them, and employ them as ſlaves. But the female children continue with their mothers, and ſupply their place *. The Egyptian women are very brown, but have lively eyes †. Their ſtature is above the middle ſize; their dreſs is not agreeable; and their converſation is exceedingly tireſome ‡. They are remarkable for bearing many children; and ſome travellers pretend, that the fertility occaſioned by the inundation of the Nile is not limited to the ſoil alone, but extends to men and other animals. They add, that the women uniformly conceive after either drinking, or bathing in the new water; that, in July and Auguſt, the women are generally impregnated, and bring forth in April and May; and that the cows commonly produce two calves, and the ewes two lambs §, &c. It is difficult to reconcile theſe benign influences of the Nile with the troubleſome diſeaſes it occaſions; for M. Granger informs us, that the air of Egypt is unwholeſome; that diſeaſes of the eyes are frequent, and ſo very difficult to cure, that the patients generally loſe their ſight; that in Egypt there are more blind perſons than in any other country; and that, during the increaſe of the Nile, moſt of the inhabitants are ſeized with ob-

* See les Voyages de Paul Lucas, p. 363.

† Les Voyages de Gemelli Carreri, tom. i. p. 190.

‡ Les Voyages du P. Vanſleb. p. 43.

§ Les Voyages du Sieur Lucas, p. 83.

ſtinate dyſenteries, occaſioned by the ſalts with which the water is then impregnated *.

Though the Egyptian women are commonly ſmall, yet the men are of a good ſize †. In general, both ſexes are of an olive colour; and the higher we aſcend from Cairo, the natives become more tawny, till we arrive at the confines of Nubia, where they are almoſt as black as the Nubians themſelves. Idleneſs and cowardice are the principal vices of the Egyptians. Their chief employment through the day is drinking coffee, ſmoaking tobacco, ſleeping, and chattering in the ſtreets. They are groſsly ignorant, and yet they are puffed up with a fantaſtical vanity. Though they acknowledge that they have loſt their ancient dignity, their ſkill in ſcience and in arms, their hiſtory, and even their language, and that, from a valiant and illuſtrious nation, they have degenerated into ſlavery and cowardice; yet ſuch is the haughtineſs of their diſpoſition, that they affect to deſpiſe all other nations, and are exceedingly offended when any perſon adviſes them to ſend their children into Europe to be inſtructed in the arts and ſciences ‡.

The numerous nations who inhabit the coaſts of the Mediterranean, from Egypt to the Weſtern ocean, and the internal regions of Barbary, as far as Mount Atlas, are compoſed of people

* See Granger's Voyage, p. 21.

† Voyages de Pietro della Valle, tom. i. p. 401.

‡ See Lucas, tom. iii. p. 194. and P. Vanſleb. p. 52.

of different races, as the original natives, Arabs, Vandals, and Spaniards; and, in more ancient times, the Romans and Egyptians peopled these territories with men of very different qualities. The inhabitants of the mountains of Arras, for example, have no resemblance in their aspect and complexion to the adjacent tribes. Their colour, instead of being tawny, is white and ruddy, and their hair is of a deep yellow; but that of the adjacent nations is black. From these circumstances Mr. Shaw thinks it probable, that they are descendants of the Vandals, who, after their expulsion, took refuge in certain parts of these mountains *. The women of the kingdom of Tripoli, though adjacent to those of Egypt, have not the smallest resemblance to them. The former are tall, and consider height of stature as an essential article of beauty. Like the Arabian females, they puncture and paint their cheeks and chin; and, as in Turkey, they are so fond of red hair, that they paint that of their children with vermillion †.

The Moorish women, in general, affect to wear their hair so long as to reach to their heels; and those whose hair is shorter, use false locks twisted round with ribbands. They paint the hair of their eye-lids with black lead, and they esteem the dark colour which this substance gives to the eyes as a singular beauty. This custom

* See Shaw's Travels.

† L'Etat des royaumes de Barbarie, La Haie, 1704.

is both very general and very ancient; it was practised by the ladies of Greece and Rome, as well as by those of the East *.

Most of the Moorish women would be reckoned handsome even in Europe. The skin of their children is exceedingly fair and delicate; and, though the boys, by being exposed to the sun, soon grow swarthy; yet the girls, who keep more within doors, preserve their beauty till the age of 30, when they commonly give over child-bearing: But, as a recompense for this early sterility, they are often mothers at the age of 11, and grandmothers at that of 22; and, as they live as long as the European women, they generally see several generations †.

In reading Marmol's description of these different nations, it is obvious to remark, that the inhabitants of the mountains of Barbary are white, and that those of the plains and sea-coasts are very brown and tawny. He tells us, that the inhabitants of Capez, a city in the kingdom of Tunis, situated upon the Mediterranean coast, are poor, and very black ‡; that those who live along the banks of the river Dara in the kingdom of Morocco, are exceedingly tawny §; and that, on the contrary, the inhabitants of Zarhou, and of the mountains of Fez, on the side of Mount Atlas, are very fair: He adds, that the latter are so little affected with cold, that, in the

* Shaw's Travels. † Ibid. ‡ Marmol, tom. ii. p. 536. § Ibid. tom. ii. p. 125.

greatest

greateſt froſts and ſnow, they dreſs very lightly, and go with their heads uncovered during the whole year *. And, with regard to the Numidians, he ſays, that they are rather tawny than black; that the women are pretty fair and jolly, though the men are meagre †; but that the inhabitants of Guaden, at the extremity of Numidia, and on the frontiers of Senegal, are rather black than tawny ‡; that, on the other hand, the women of the province of Dara are beautiful and freſh-coloured; and that, through this whole region, there are multitudes of negroe ſlaves of both ſexes §.

It appears, then, that, in the ancient Continent, all the people who live between the 20th and 30th, or 35th degree of north latitude, namely, from the Mogul Empire to Barbary, and even from the Ganges to the weſtern coaſt of Morocco, differ but little from each other, except thoſe varieties which have ariſen from a mixture with more northern nations, who, from time to time, have conquered and peopled ſome of thoſe vaſt regions. In this extenſive territory, which ſtretches, within the ſame parallels, about 2000 leagues, the men, in general, are brown and tawny, but, at the ſame time, pretty comely and handſome. If we next examine thoſe who live under more temperate climates, we ſhall find, that the natives of the northern parts of

* Marmol, tom. ii. p. 198. 305. † Ibid. tom. iii. p. 6.
‡ Ibid. tom iii. p. 7. § Ibid. tom. iii. p. 11.

 the

the Mogul and Perſian Empires, the Armenians, the Turks, the Georgians, the Mingrelians, the Circaſſians, the Greeks, and the people of Europe in general, are the faireſt and moſt handſome men in the world; and that, however remote Caſhmire may be from Spain, or Circaſſia from France, the natives of theſe countries, which are nearly at an equal diſtance from the equator, have a ſtriking reſemblance to each other. The people of Caſhmire, Bernier remarks, are renowned for their beauty. They are as handſome as the Europeans, and have no features of the Tartarian viſage; neither have they thoſe flat-noſes and pig-eyes ſo univerſal among the adjacent nations. Their women are exceedingly beautiful; and it is a common practice with ſtrangers, when they come to the Mogul court, to provide themſelves with Caſhmirian wives, that they may have children by them as fair as true Moguls *.

The blood of Georgia is ſtill more refined than that of Caſhmire. In this country, not an ugly countenance is to be ſeen: And, with regard to the women, Nature has adorned them with a profuſion of graces: They are tall, handſome, ſlender-waiſted; and their faces are truly charming †. The men are likewiſe very handſome ‡. They are naturally ingenious; and,

* See Voyage de Bernier, tom. ii. p. 281.

† See Chardin, p. 204.

‡ See il Genio vagante del Conte Aurelio degli Anzi, tom. i. p. 170.

if

if their education did not render them extremely ignorant and debauched, they might make no inconſiderable progreſs in the arts and ſciences. But there is not, perhaps, a country in the univerſe where drunkenneſs and libertiniſm have arrived at ſo high a pitch as in Georgia. Chardin tells us, that even the clergy are much addicted to wine; that they keep a number of female ſlaves in their houſes, which they uſe as concubines; and that nobody is offended at this practice, becauſe it is general, and even authoriſed. He adds, that he was informed by the prefect of the Capuchins, that the Patriarch of Georgia declares publicly, that the man who does not get drunk at their great feſtivals, as thoſe of Eaſter and Chriſtmas, is unworthy of the name of a Chriſtian, and ought to be excommunicated *. With all theſe vices, however, the Georgians are a civil, humane, grave, and peaceable people. They ſeldom indulge reſentment; but, when they conceive a hatred againſt any perſon, they are never to be reconciled.

The women of Circaſſia, Struys remarks, are likewiſe exceedingly fair and beautiful. Their complexion conſiſts of the moſt delicate tints. Their forehead is large and ſmooth; and, without the aſſiſtance of art, their eye-brows are ſo fine, that they reſemble curved threads of ſilk. Their eyes are large, attracting, and full of fire. Their noſes are well ſhaped, and their lips are

* Chardin, p. 205.

perfect vermilion. Their mouth is ſmall, and the perpetual reſidence of ſmiles; their chin is the termination of the completeſt oval. Their neck and throat are extremely handſome; their ſkin is white as ſnow; the colour of their hair is a beautiful black; their ſtature is tall, and their carriage eaſy. They wear a little black cap, upon which is faſtened a roller of the ſame colour. But, what is extremely ridiculous, the widows, in place of this roller, wear a bladder of an ox or a cow, fully blown up with air, which disfigures them amazingly. In ſummer, the women of inferior ſtation wear only a ſhift, which is generally blue, yellow, or red, and open to the middle of the body. Their breaſts are finely formed; and though, pretty familiar with ſtrangers, they are faithful to their huſbands, who are by no means jealous of them *.

Tavernier alſo informs us, that the women of Comania and Circaſſia, like thoſe of Georgia, are very handſome and beautiful; that they retain the freſhneſs of their complexion till the age of 45 or 50; that they are all very induſtrious, and often employed in the moſt laborious offices. Theſe people have preſerved uncommon liberties in their laws regarding marriage. If a huſband is not pleaſed with his wife, and makes the firſt complaint, the ſeigneur of the diſtrict ſends for the wife, ſells her, and provides the huſband with another. The wife, if

* See Struys, tom. ii. p. 75.

ſhe

ſhe makes the firſt complaint, enjoys the ſame privilege*.

The Mingrelians, according to the relations of travellers, are as handſome and beatutiful as the Georgians or Circaſſians, and they ſeem to be the ſame race of people. ‘ In Mingrelia,’ ſays Chardin, ‘ there are women extremely ‘ handſome, of a majeſtic air, whoſe form and ‘ viſage are enchanting, and their aſpect attracts ‘ every beholder. Thoſe who are leſs handſome, ‘ or advanced in years, daub their eye-brows, ‘ cheeks, forehead, noſe, and chin, with coarſe ‘ paint. Others paint their eye-brows only, and ‘ beſtow much attention to their dreſs, which is ‘ ſimilar to that of the Perſians. They wear a ‘ veil, which covers only the crown and back ‘ part of the head. Though lively, civil, and ‘ affectionate, they are extremely perfidious; and ‘ there is no wickedneſs which they will not ‘ perpetrate, in order to procure, to preſerve, or ‘ to get rid of their gallants. The men have ‘ likewiſe many bad qualities. They are all ‘ trained to robbery, which they ſtudy both as a ‘ buſineſs and an amuſement. They relate, with ‘ extreme ſatisfaction, the depredations they have ‘ committed, and derive from this polluted ‘ ſource their greateſt praiſe and honour. In ‘ Mingrelia, falſehood, aſſaſſination, and theft, ‘ are good actions, and whoredom, bigamy, and ‘ inceſt, are virtuous habits. A man marries

* See Tavernier, tom. I. p. 469.

‘ two

'two or three wives at a time, and keeps as many concubines as he chooses. Husbands in this country are not jealous of their wives; and, when a wife is detected in the act of infidelity, he has only a right to demand a pig from the gallant, who generally eats a share of it in company with the husband and wife. To have many wives and concubines, they pretend to be a good and laudable practice, because it enables them to beget the more children, whom they sell for gold, or exchange for wares and provisions *.' The Mingrelian slaves are not dear. A man, from 25 to 40 years, may be purchased for 15 crowns; and when farther advanced, for 8 or 10. The finest girls, from 13 to 18, cost only 20 crowns, a woman about 12 crowns, and children only 3 or 4 †.

The Turks, who purchase vast numbers of these slaves, are so blended with the Armenians, Georgians, Arabians, Egyptians, and even with the Europeans, that it is impossible to distinguish the real natives of Asia Minor, Syria, and the rest of Turkey. In general, the Turks are robust, and tolerably well made ‡; and crooked or deformed persons are rarely to be met with among them. Most of their women are likewise handsome and beautiful: They are also very fair, because they seldom go abroad, and never without being covered with a veil ||.

* Chardin, p. 77. † Ibid. p. 105. ‡ Thevenot, tom. i. p. 55. || Ibid. tom. i. p. 105.

'There

'There is not,' ſays Belon, 'a woman in 'Aſia, however mean her condition, who has 'not a complexion freſh as a roſe, and whoſe 'ſkin is not fair, delicate, and ſmooth as velvet: 'They make an unguent of Chian earth, with 'which they anoint their whole bodies before 'they go to bathe. Some likewiſe paint the 'eye-brows of a black colour; while others 'eradicate the hairs with rufma, and paint artifi-'cial eye-brows in the form of a black creſcent, 'which have a beautiful appearance at a diſtance, 'but are very ugly when viewed more cloſely. 'This cuſtom, however, is extremely ancient *.' He adds, that, in Turkey, neither men nor women wear hair on any part of the body, except the head and chin; that they make an ointment, compoſed of equal quantities of ruſma and quick lime, diluted in water, which they apply before they enter the warm bath; that, when they begin to ſweat in the bath, the hairs fall off by ſimple rubbing with the hand, and the ſkin remains ſoft and ſmooth, without the leaſt veſtige of hair on it †: He farther remarks, that, in Egypt, there is a ſhrub called *alcanna*, the leaves of which, when dried and pounded, make a yellow reddiſh paint, and with which the Turkiſh women tinge their hands, feet, and hair. With the ſame ſubſtance they paint the hair of their children, and the manes of their horſes ‡.

* Obſerv. de Pierre Belon, p. 199. † Ibid. p. 198.
‡ Ibid. p. 136.

The women of Turkey likewiſe uſe a preparation of tutty to render their eyes of a deeper black. They bathe often, uſe perfumes, and employ every art to preſerve and improve their beauty. The Perſian women are ſaid to be ſtill more anxious on this ſubject than the Turks. The men have alſo different taſtes with regard to beauty; the Perſians are fond of brown complexions, and the Turks prefer the red *.

It has been alledged, that the Jews, who came originally from Syria and Paleſtine, ſtill preſerve their former darkneſs of complexion. But, as is properly remarked by Miſſon, the Jews of Portugal alone are tawny, becauſe, by conſtantly marrying thoſe of their own tribe, the children of theſe people always reſemble their parents, and the tawny colour is thus perpetuated, with little diminution, even in the northern countries. The Jews of Germany, however, as thoſe of Prague, for example, are not more ſwarthy than the other inhabitants of that country †.

The preſent natives of Judea reſemble the other Turks; but they are more ſwarthy than thoſe who live in Conſtantinople, or on the coaſts of the Black Sea; in the ſame manner as the Arabians are browner than the Syrians, becauſe they inhabit a more ſouthern climate.

The ſame obſervation is applicable to the Greeks; the inhabitants of the north are fairer

* See Voyage de la Boulaie, p. 110.

† Voyages de Miſſon, tom. ii. p. 225.

than

than those of the islands or of the southern provinces. In general, the Greek women are still more beautiful and vivacious than the Turks. They have likewise the advantage of enjoying a greater degree of liberty. Gemelli Carreri informs us, that the women of the island of Chio are fair, beautiful, lively, and very familiar with the men; that the young girls see strangers without restraint; and that they all go with their necks uncovered *. He likewise remarks, that the Greek women, especially in the neighbourhood of Constantinople, have extremely fine hair; but that those whose hair descends to their heels are less regular in their features †.

The Greeks esteem large eyes and high eyebrows as great points of beauty in either sex ‡; and it is worthy of remark, that, in all the busts and medals of the ancient Greeks, the eyes are much larger than in those of the ancient Romans.

The inhabitants of the Archipelago are remarkably fine swimmers and divers. Thevenot tells us, that they exercise themselves in bringing up sponges, and even lost goods, from the bottom of the sea; and that, in the island of Samos, a young man cannot obtain a wife, unless he be able to dive at least eight §, or, accord-

* Voyages de Gemelli Carreri, tom. i. p. 110.

† Idem, tom. i. p. 363.

‡ Observ. de Belon, p. 200.

§ Thevenot, tom. i. p. 206.

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ing to Dapper, 20 fathoms*. The latter adds, that, in some of the islands, as that of Nicaria, they have a strange practice of conversing with each other at great distances; and that their voices are so strong, that, at the distance of a quarter of a league, and sometimes of a whole league, those islanders can maintain a conversation, which is necessarily interrupted by long intervals, the answer not arriving for several seconds after the question.

The Greeks, the Neapolitans, the Sicilians, the Corsicans, the Sardinians, and the Spaniards, being situated nearly under the same latitude, are very similar in their complexions. All these people are more swarthy than the French, the British, the Germans, the Polanders, the Moldavians, the Circassians, and all the other inhabitants of the northern parts of Europe, till we advance to Lapland, where, as formerly remarked, we meet with another race of men. In travelling through Spain, a difference of colour is perceptible even at Bayonne; there the complexion of the women is browner, and their eyes are more brilliant †.

The Spaniards, though meagre, are handsome. Their features are regular, their eyes beautiful, and their teeth well arranged: But their complexion is yellow and swarthy. Their children are born fair and beautiful; but, as they grow

* Description des Isles de l'Archipel. par Dapper, p. 163.
† Relation du Voyage d'Espagne, p. 4.

up, their colour changes in a ſurpriſing manner: The operation of the air and of the ſun ſoon renders them ſo yellow and tawny, that a Spaniard is eaſily diſtinguiſhed from a native of any other country in Europe*. In ſome provinces of Spain, as in the environs of the river Bidaſſao, it has been remarked, that the inhabitants have ears of an uncommon ſize†.

Black or brown hair begins to be unfrequent in Britain, in Flanders, in Holland, and in the northern provinces of Germany; and in Denmark, Sweden, and Poland, it is ſeldom to be met with. Linnæus informs us, that the Goths are tall; that their hair is ſtraight, and as white as ſilver; and that the iris of their eye is blueiſh: 'Gothi corpore proceriore, capillis albidis rectis, 'oculorum iridibus cinereo-cœruleſcentibus.' The Finlanders, he adds, are muſcular and fleſhy; their hair is long, and of a whitiſh yellow colour; and the iris of the eye is of a deep yellow: 'Fennones corpore toroſo, capillis flavis 'prolixis, oculorum iridibus fuſcis‡.'

The women of Sweden are very prolific. Rudbeck ſays, that they generally bring forth 8, 10, or 12 children; and that 18, 20, 24, and even 30, are not uncommon. He adds, that the men often exceed the age of 100 years; that ſome arrive at 140; and that one Swede lived 156, and another 161 years‖. But this author,

* Ibid. p. 187. † Ibid. p. 326. ‡ See Linnæi Faunam Suecicam, p. 1. ‖ See Olaii Rudbekii Atlantica.

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it muſt be allowed, is an enthuſiaſt with regard to his country; and in his eſtimation, Sweden is the beſt country in the world. This extraordinary fertility in the Swediſh women implies not an uncommon propenſity to love. Mankind are more chaſte in cold than in hot climates. Though the women of Sweden are leſs amorous than thoſe of Spain or Portugal, yet they bring forth more children. The northern nations, it is well known, have over-run all Europe to ſuch a degree, that hiſtorians have diſtinguiſhed the North by the appellation of 'Officina Gentium.'

The author of the 'Hiſtorical Voyages of 'Europe' agrees with Rudbeck, that the Swedes live longer than any other people of Europe; and adds, that he ſaw ſeveral men who, he was aſſured, had exceeded their 150th year*. This longevity of the Swedes he aſcribes to the ſalubrity of the air. He makes the ſame remark with regard to Denmark: The Danes, he ſays, are tall and robuſt, of a lively and florid complexion, and, on account of the ſalubrity of the air they reſpire, live very long: The Daniſh women are alſo fair, handſome and extremely prolific †.

Previous to the reign of the Czar Peter I. the Ruſſians, we are told, were almoſt entirely barbarous. Born in ſlavery, they were ignorant, brutal, cruel, and had neither courage nor man-

* See les Voyages Hiſtoriques de l'Europe, tom. viii. p. 229.
† Ibid. tom. viii. p. 279.

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ners. Men and women often bathed promiſcuouſly in baths heated to a degree that would have been inſupportable to any other people; and, like the Laplanders, immediately after coming out of theſe hot baths, they plunged themſelves into cold water. Their food was extremely coarſe. Cucumbers or melons, which they brought from Aſtracan, and preſerved during the ſummer, in a mixture of water, flour, and ſalt, were their favourite diſhes*. Some abſurd ſcruples prevented them from eating particular meats, as pigeons and veal. But, even at this unrefined period, the women knew the arts of colouring their cheeks, pulling out their eyebrows, and painting artificial ones. They alſo adorned themſelves with jewels and pearls, and their garments were made of valuable ſtuffs. Is it not apparent, from theſe circumſtances, that the barbarity of the Ruſſians had already begun to decay, and that their ſovereign had not ſuch amazing difficulties in poliſhing them, as ſome authors are deſirous of inſinuating? They are now a civilized and commercial people; they are fond of the arts and ſciences, of public ſpectacles, and of ingenious novelties. Such important changes cannot be produced by a great man; but a great man may be born in a fortunate moment.

It has been alledged by ſome authors, that the air of Muſcovy is ſo ſalubrious as to prevent the

* See la Relation curieuſe de Moſcovie, p. 181.

 exiſtence

exiſtence of peſtilential contagion. It is recorded, however, in their own annals, that, in the 1421, and during the ſix ſubſequent years, the Muſcovites were ſo dreadfully afflicted with contagious diſtempers, that the conſtitution of their deſcendants ſuffered a conſiderable change. Before that æra, many men lived above 100 years; but very few now arrive at that age*.

The Ingrians and Carelians, who inhabit the northern provinces of Muſcovy, and are the natives of the country round Peterſburg, have vigorous and robuſt conſtitutions. Moſt of them have white or fair hair†. They reſemble the Findlanders, and ſpeak the ſame language, which has no affinity to any of the other European tongues.

From the above hiſtorical account of all the inhabitants of Europe and Aſia, it is apparent, that the differences in colour depend much, though not entirely, upon the climates. There are many other cauſes which have an influence upon the colour, and even upon the features and corporeal form of different people. The nature of the food is one of the principal cauſes; and we ſhall afterwards conſider the changes it may produce. Manners, or the mode of living, may alſo have conſiderable effects. A poliſhed people, who are accuſtomed to an eaſy, regular, and tranquil mode of life, and who, by the vigi-

* See le Voyage d'un Ambaſſadeur de l'Empereur Leopold au Czar Michaëlowits, p. 220.

† See les Nouveaux Memoires ſur l'Etat de la Grand Ruſſie, tom. ii. p. 64.

lance of a wiſe government, are removed from the dread of oppreſſion and miſery, will, for theſe reaſons alone, be more ſtrong, vigorous, and handſome, than ſavage and lawleſs nations, where every individual, deriving no ſuccours from ſociety, is obliged to provide for his own ſubſiſtence, to ſuffer alternately the pangs ariſing from hunger and from ſurfeits of unwholeſome food, to ſink under the fatigues of hard labour, to feel the rigours of a ſevere climate, without poſſeſſing the means of alleviating them, to act, in a word, more frequently like a brute than a man, Suppoſing two nations, thus differently circumſtanced, to live under the ſame climate, it is reaſonable to think, that the ſavage people would be more ugly, more tawny, more diminutive, and more wrinkled, than the nation that enjoyed the advantages of ſociety and civilization. If the former had any ſuperiority over the latter, it would conſiſt in the ſtrength, or rather in the hardineſs, of their bodies. Among the ſavage people, there might likewiſe be fewer examples of lameneſs, and of other bodily impediments or deformities. Such men can live, and even multiply, in a poliſhed ſtate, where each individual contributes to the ſupport of his neighbour, where the ſtrong injure not the feeble, and where the qualities of the body are leſs eſteemed than thoſe of the mind. But, among a ſavage people, as every individual muſt ſubſiſt and defend himſelf by corporeal ſtrength and addreſs alone,

 thoſe

those who unfortunately come into the world with deformed bodies, or feeble constitutions, fall early victims to the defects of Nature.

Three causes, therefore, must be admitted, as concurring in the production of those varieties which we have remarked among the different nations of this earth: 1. The influence of climate; 2. Food, which has a great dependance on climate; and, 3. Manners, on which climate has, perhaps, a still greater influence. But, before we attempt to establish this opinion by reasoning, it is necessary to give as minute a description of the inhabitants of Africa and America, as we have already given of those of Europe and Asia.

We have already mentioned the different nations who inhabit the northern parts of Africa, from the Mediterranean to the Tropic. All those beyond the Tropic, from the Red Sea to the Ocean, an extent of country about 100 or 150 leagues wide, are a species of Moors, though so swarthy, that they appear to be almost black. The men, in particular, are exceedingly brown; the women are a little fairer, well made, and tolerably beautiful. Among those Moors, there is a vast number of Mulattoes, who are of a still deeper black; because they are born of Negroe women whom the Moors purchase, and with whom they have many children*. Beyond this territory, under the 17th or 18th de-

* See Marmol, tom. iii. p. 29. 33.

gree of north latitude, we find the Negroes of Senegal and of Nubia, both on the coast of the western ocean, and on that of the Red Sea; and then, from the 18th degree of north to the 18th of south latitude, the whole inhabitants of Africa, except the Ethiopians or Abyssinians, are perfectly black. Thus the portion of the globe allotted by Nature to this race of men, contains an extent of territory parallel to the Equator, of about 900 leagues in breadth, and considerably more in length, especially northward of the Equinoctial line. But, beyond the 18th or 20th degree of south latitude, the natives are no longer Negroes, as shall be evinced when we describe the Caffres and Hottentots.

We have long been deceived with regard to the colour and features of the Ethiopians, because they have been confounded with their neighbours the Nubians, who are a different race of people. Marmol tells us, that the Ethiopians are perfectly black, and that they have large faces and flat noses*; and the Dutch travellers give the same description of these people †. The truth, however, is, that the Ethiopians differ from the Nubians both in colour and features. The natural colour of the Ethiopians is brown or olive, like that of the southern Arabs, from whom they probably derive their origin. They are tall, and have regular features, fine eyes,

* Marmol, tom. iii. p. 68. † Recueil des Voy. de la Comp. des Indes de Holl. tom. iv. p. 33.

 well

well proportioned noſes, thin lips, and white teeth. But the Nubians have flat noſes, thick prominent lips, and their viſages are extremely black*. Theſe Nubians, like their weſtern neighbours, are a ſpecies of Negroes, very ſimilar to thoſe of Senegal.

The Ethiopians are a half poliſhed people. They wear garments of cotton and of ſilk. Their houſes are low and ill built. In the culture of their lands they are extremely negligent; becauſe the citizens and common people are deſpiſed, oppreſſed, and plundered by the nobles. Each of theſe claſſes lives ſeparate from one another in their own villages or hamlets. Their country produces no ſalt, and the people purchaſe it for an equal weight of gold. They are fond of crude meat; and, in their feaſts, the ſecond courſe, which they regard as the moſt delicate, conſiſts of fleſh entirely raw. Though they have vines, they make no wine; and their only beverage is a ſour compoſition of tamarinds and water. They travel on horſes, and uſe mules for tranſporting their merchandiſe. Their knowledge of the arts and ſciences is extremely limited; for their language is without rule, and their manner of writing is ſo imperfect, that they require ſeveral days to write a letter, though their characters are more beautiful than thoſe of the Arabians†. Their mode of ſalutation is ſingular:

* Lettres edifiantes, recueil iv. p. 349.

† See Voyages de la Comp. de Holl. tom. iv. p. 34.

They

They take one another by the right hand, and mutually apply it to their mouths; the faluter then takes off the fcarf of the perfon he falutes, and wraps it round his own body, by which the other is left half naked; for moft of the Ethiopians wear only this fcarf and a pair of cotton drawers*.

Admiral Drake, in his voyage round the world, mentions a fact, which, though fingular, appears not to be incredible. On the frontiers of the defert of Ethiopia, he remarks, there are men called *Acridophagi*, or locuft-eaters, who are black, meagre, extremely nimble, and of fmall ftature. In the fpring-feafon, infinite numbers of locufts are tranfported into their country by certain hot winds which blow from the weft. Having neither cattle nor fifh, they are obliged to live upon thefe locufts, which they amafs in vaft quantities: They cure them with falt, and preferve them for food during the whole year. This wretched nourifhment produces very ftrange effects: The people hardly reach the age of 40 years; and, when they approach to this period of life, winged infects † are engendered under their fkin, which at firft create a violent itching, and foon multiply fo amazingly, that their whole flefh fwarms with them. They begin with devouring the belly, then the breaft, and proceed in their ravages till they eat the whole flefh from the bones. Thus are thofe men, whom

* Lettres edifiantes, recueil iv. p. 349.

† The author, inftead of winged infects, fhould have faid caterpillars.

Nature forces to feed upon insects, devoured in their turn by these vermin. If this fact were well attested; it would afford ample scope for reflection.

In Ethiopia, and in that tract of land which stretches to Cape Gardufu, there are vast deserts. This country, which may be regarded as the most easterly part of Ethiopia, is almost entirely uninhabited. To the south, Ethiopia is bounded by the Bedwins, and some other nations, who observe the Mahometan law; a circumstance which corroborates the opinion, that the Ethiopians have originated from the Arabians. These two people are only separated by the Straits of Babelmandel. It is probable, therefore, that the Arabians had formerly invaded Ethiopia, and obliged the natives of that country to retire to the northern parts of Nubia. The Arabians have even spread themselves along the coasts of Melinda; for the inhabitants of those coasts are only tawny, and follow the religion of Mahomet*. Even in Zanguebar, the natives are not black; most of them speak the Arabic language; and they wear cotton stuffs. This country, though under the Torrid Zone, is not excessively hot; and the hair of the natives is black and crisped like that of the Negroes †. Upon the whole of this coast, as well as at Mosambique and Madagascar, we meet with some white men, who, it is alledged, came originally from China, and settled there, when the Chinese were accus-

* See Pigafetta, p. 56.

† Marmol, p. 107.

tomed to ſail over all the eaſtern ſeas, in the ſame manner as they are now navigated by the Europeans. Though this opinion be problematical, it is certain, that the nations of this eaſtern coaſt of Africa are black, and that the tawny or white people found there have come from other countries.

But, to form a juſt idea of the varieties which occur among theſe black nations, requires a more minute examination.

From comparing the teſtimonies of travellers, it, in the firſt place, appears, that the varieties among the blacks are equally numerous as thoſe among the whites. The blacks, as well as the whites, have their Tartars and their Circaſſians. The natives of Guiney are extremely ugly, and have an inſufferable odour: Thoſe of Sofala and of Moſambique are beautiful, and have no bad ſmell. It is, therefore, neceſſary to divide the blacks into different races; and, I think, they may be reduced to two principal races, that of the Negroes, and that of the Caffres. Under the firſt I comprehend the blacks of Nubia, of Senegal, of Cape Verd, of Gambia, of Sierra-leona, of the Teeth and Gold Coaſts, of that of Juda, Benin, Gabon, Loango, Congo, Angola, and of Benguela, as far as Cape Negro. Under the ſecond, I include all the nations from Cape Negro to the point of Africa, where they aſſume the name of *Hottentots*, and all thoſe on the eaſtern coaſt, within the ſame latitude, as the terri-

tories

tories of Natal, of Sofala, of Monomotapa, of Mofambique, of Melinda: The blacks of Madagafcar, and of the neighbouring iflands, are likewife Caffres, and not Negroes. Thefe two races of men have a greater refemblance to each other in colour than in their features, hair, skin, or fmell: Their manners and natural difpofitions are likewife very different.

On a clofer examination of the different people of which each of thefe races confift, we fhall find as many varieties among the blacks as among the whites, and an equal number of fhades from brown to black, as we have found from brown to white in the other race.

We fhall begin with the countries to the north of Senegal, and, proceeding along the coafts, we fhall confider the different nations which have been recognifed and defcribed by travellers. In the firft place, it is certain, that the natives of the Canary iflands are not Negroes; for we are affured by voyagers, that the ancient inhabitants of thefe iflands were tall, well made, and of a vigorous complexion; that the women were beautiful, and had fine hair; and that the inhabitants of the fouthern parts of each ifland were more olive than thofe on the northern parts*. Duret, in the hiftory of his voyage to Lima†, informs us, that the ancient inhabitants of the ifland of Teneriff were tall and robuft, but

* See l'Hiftoire de la premiere decouverte des Canaries, par Bontier et Verriere, p. 251. † Page 72.

meagre

meagre and tawny, and that moſt of them had flat noſes*. Theſe people, we ſee, had nothing in common with the Negroes, except the flat noſe. The natives of Africa, in the ſame latitude with theſe iſlands, are Moors, and very tawny; but, like the iſlanders, they evidently belong to the race of whites.

The inhabitants of Cape Blanc are Moors, and follow the religion of Mahomet. Like the Arabs, they wander about from place to place, paſturing their horſes, camels, oxen, goats, and ſheep. They trade with the Negroes, who give them eight or ten ſlaves for a horſe, and two or three for a camel†. It is from theſe Moors that we have the gum Arabic, which they diſſolve among their milk. They ſeldom eat fleſh, and never kill their cattle, but when they are about to die of old age or diſeaſe‡.

The Moors are ſeparated from the Negroes by the river Senegal. They are only tawny, and live on the north ſide of this river; but the Negroes who inhabit the ſouth ſide of it are abſolutely black. The Moors wander through the country; but the Negroes are ſedentary, and dwell in villages. The former are free and independent; the latter are the ſlaves of tyrants, who oppreſs them. The Moors are ſmall, meagre, and have a puſillanimous aſpect; but they are ſly and ingenious. The Negroes, on

* Hiſt. gen. des Voyages, par M. l'Abbé Prevot, tom. ii. p. 230. † Voyage du le Maire, p. 46. ‡ Ibid. p. 66.

the

the contrary, are large, plump, and well made; but they are ſimple and ſtupid. In fine, the country inhabited by the Moors conſiſts of barren ſands, where verdure appears only in very few places. But the Negro country is rich, fertile in paſture, and produces millet, and trees which are always green, but few of them bear fruit fit for food.

In ſome places, both on the north and ſouth of the river Senegal, there is a ſpecies of men called *Foulies*, who ſeem to form the ſhade between the Moors and Negroes, and who are, perhaps, Mulattoes, produced by a mixture of the two nations. Theſe Foulies are not entirely black, like the Negroes; but they are much browner than the Moors, and hold the middle rank between the two. They are likewiſe more advanced in civilization than the Negroes; they follow the religion of Mahomet, and are hoſpitable to ſtrangers *.

The Cape de Verd iſlands are peopled with Mulattoes, ſprung from the Portugueſe who firſt ſettled there, and the Negroes whom they found on theſe iſlands. They are called *Copper-coloured Negroes*, becauſe, though they reſemble the Negroes in their features, they are leſs black, or rather yellowiſh. They are handſome and ingenious, but extremely indolent and idle. They live chiefly by hunting and fiſhing. They train their dogs to kill the wild goats, with

* Voyage du le Maire, p. 75. Marmol, tom. i. p. 34.

which

which the iſlands abound. They deliver their wives and daughters to the embraces of ſtrangers, if they chooſe to pay for this ſingular favour. For pins and other trifles, they ſell paroquets, porcelain-ſhells, ambergris*, &c.

The firſt genuine Negroes we meet with, are thoſe on the ſouthern banks of the Senegal. Theſe people, as well as thoſe who inhabit the country comprehended between this river and that of Gambia, call themſelves *Jaloffs*. They are very black, handſome, of a fine ſtature, and their features are not ſo diſagreeable as thoſe of the other Negroes. Some of them, and particularly the women, have very regular features. They have the ſame ideas of beauty with the Europeans; for they are fond of fine eyes, a ſmall mouth, thin lips, and a well proportioned noſe; they differ only with regard to the baſis of the picture, a very black ſhining colour being abſolutely neceſſary to form a beauty: Their ſkin is very fine and ſoft; and, abſtracting from colour, they have as beautiful women as are to be met with in any other country in the world. Their females are generally handſome, gay, active, and extremely amorous: They are peculiarly fond of white men, whom they careſs with ardour, both to ſatisfy themſelves, and in hopes of obtaining preſents. In their attachment to ſtrangers, they meet with no reſtraint from their huſbands. But, though they offer

* See les Voyages de Roberts, p. 387. Struys, tom. i. p. 11. Piervillas, p. 15.

their wives, daughters, and sisters, to strangers, and conceive their honour to be injured by a refusal, their jealousy rises to such a pitch, when their wives transgress with men of their own nation, that they often beat, and even cut themselves with sabres. Those women, notwithstanding, have the tobacco-pipe perpetually in their mouths, and their skin, when they are heated, has a disagreeable smell, though it is not so strong as that of the other Negroes. They love dancing to the sound of the drum and calabash. All their movements in these dances consist of lascivious and indecent postures. They bathe often; and file their teeth, in order to render them more equal. Most of the young girls engrave figures of animals, flowers, &c. on their skin.

It is a general practice among the Negroe women, when travelling, to carry their children on their backs. Some have ascribed the flat nose and big bellies of the Negroes to this cause: The mother, in raising the child by sudden jerks, makes the child's nose strike against her back; and the child, to avoid these frequent blows, keeps its head as far back as possible, by pushing its belly forward*. Their hair is black and crisped like curled wool. It is by the hair and the colour that they chiefly differ from other men; for their features are not, perhaps, so dif-

* See le Maire, p. 144. Le Père du Jaric, p. 364. et le Père du Tertre, p. 493.

ferent from thoſe of the Europeans, as the Tartarian viſage differs from that of a Frenchman. Father Tertre affirms, that, if moſt of the Negroes are flat noſed, it is owing to a general practice of the mothers, who depreſs the noſes of their children as ſoon as they come into the world, and ſqueeze their lips to make them thick; and that thoſe children, who chance to eſcape theſe operations, have elevated noſes, thin lips, and as fine features as the Europeans. This remark, however, is only applicable to the Negroes of Senegal, who are the moſt handſome and moſt beautiful of all the race. Among all the other Negroes, flat noſes and thick lips ſeem to be features beſtowed on them by Nature: Theſe, inſtead of deformities, are regarded as marks of beauty, and ſupplied by art, when they happen to be denied by Nature.

The Negroe women are extremely prolific: They bring forth their children with great eaſe, and require no aſſiſtance. Their labours are followed by no troubleſome conſequences; for their ſtrength is fully reſtored by a day, or, at moſt, two days repoſe. They make excellent nurſes, and manage their children with great tenderneſs and affection. They are alſo more lively and alert than the men; and they even cultivate the virtues of diſcretion and temperance. Father Jaric informs us, that the Jaloff Negroe women, in order to accuſtom themſelves to eat and ſpeak little, fill their mouths with water in the

the morning, and keep it there till the hour of breakfaſt*.

The Negroes of the iſland of Goree, and of the Cape de Verd coaſt, like thoſe on the banks of the Senegal, are well made and extremely black. They are ſo fond of a black ſhining complexion, that they deſpiſe ſuch as want this perfection, in the ſame manner as tawny men are deſpiſed by the Europeans. Though ſtrong and robuſt, they are exceedingly indolent, and cultivate neither corn, wines, nor fruits. Fiſh and millet are their chief articles of food; and they ſeldom eat fleſh. They compare the Europeans to horſes, becauſe they eat herbs. But they are ſo paſſionately fond of ſpirits, that they ſell their children, their parents, and even themſelves, for brandy†. They go almoſt naked, having only a cotton garment which covers them from the middle to about one half of the thigh; and they alledge that the heat of the climate permits them not to wear any more‡. Their poverty and bad chear, however, hinder them not from being both fat and contented. They believe their country to be the fineſt in the univerſe; and that they are the handſomeſt men in the world, becauſe they are the blackeſt: If their women betrayed no attachment to white men, their colour would give them no uneaſineſs.

* See l'Hiſt. par Pêre du Jaric, part iii. p. 365.
† See le Voy. de M. de Gennes, p. 15.
‡ Lettres Edifiantes, recueil xi. p. 48.

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Though the Negroes of Sierra-leona be not altogether ſo black as thoſe of Senegal, they are not, however, as Struys alledges *, of a reddiſh, or tawny colour. Like the Guiney Negroes, they are of a black leſs deep than the natives of Senegal. The general cuſtom among the Negroes of Guiney and Sierra-leona, of painting their bodies with red and other colours, might deceive Struys. They likewiſe paint a ring round their eyes with white, yellow, or red, and make rays of different colours upon their faces; and many of them cut, upon their ſkin, figures of plants and of animals. Their women are ſtill more debauched than thoſe of Senegal. Many of them are common proſtitutes, without incurring the ſmalleſt diſhonour. Both men and women keep their heads uncovered; and they ſhave or cut their hair, which is very ſhort, in various modes. They wear ear-rings made of teeth, ſhells, horns, bits of wood, &c. which weigh three or four ounces. Some of them pierce their noſtrils or their upper lip, for the purpoſe of ſuſpending ſimilar ornaments. Their garments conſiſt of a kind of apron made of the bark of a tree, covered with apes ſkins; and to theſe ſkins they fix ſmall bells. They ſleep upon bull-ruſh mats; they eat fiſh, or fleſh, when they can procure it; but yams and bananas are their principal food †. They

* Tom. i. p. 22.

† See Indiæ Orient. par. ii. in qua Johannis Hugonis Linſcotani, &c. navigatio, p. 11.

 have

have no passion but for their women, and no inclination to activity or labour. Their houses are wretched huts. They often continue to live in wild and barren places, though in the neighbourhood of rich valleys, hills covered with trees, green and fertile fields, intersected in the most delightful manner with rivers and brooks. But their indolence and stupidity make them insensible to every pleasure of this nature. The roads which lead from one place to another are generally twice as long as they ought; but they attempt not to render them shorter; and, though the means were pointed out to them, they never think of taking the shortest road, but mechanically follow the beaten track, and are not anxious about losing time, which they have no mode of measuring.

Though the Guiney Negroes enjoy good health and have vigorous constitutions, they seldom reach old age. A Negroe of 50 years is a very old man. Their premature commerce with the women is, perhaps, the cause of the brevity of their lives. Their children, when very young, are allowed to commit every species of debauchery*; and nothing is so rare among these people as to find a girl who can remember the time when she ceased to be a virgin.

The islands of St. Thomas, of Annobona, &c. are inhabited by Negroes similar to those on the

* See le Voy. de Guinée par Guill. Bosman, p. 143.

neigh-

neighbouring continent; but their numbers are few; becauſe the Europeans have chaſed them off, and retained only ſuch as they reduced to ſlavery. Both men and women go naked, except a ſmall apron round their middle *. Mandelſlo alledges that the Europeans who ſettle in the iſland of St. Thomas, which is but a degree and a half from the Equator, preſerve their whiteneſs till the third generation; and he ſeems to inſinuate that they turn black after that period. But it is not probable that this change can be ſo ſuddenly effected.

The Negroes on the coaſts of Juda and Arada, are leſs black than thoſe of Senegal, Guiney, and Congo. They prefer the fleſh of dogs to all other meat, a roaſted dog being generally the firſt diſh preſented at their feaſt. This taſte is not peculiar to the Negroes; the ſavages of North America, and ſome Tartarian nations, are equally fond of dogs fleſh. The Tartars are even ſaid to caſtrate dogs, in order to fatten them and improve their fleſh †.

Pigafetta, and Drake, who ſeems to copy him verbatim, informs us, that the Negroes of Congo are black, but leſs ſo than thoſe of Senegal. Their hair is generally black and criſped, though in ſome it is red. The men are of a middle ſtature; in ſome, the eyes are brown; in others, they are of a ſea-green colour. Their lips are

* Pyrard, p. 16. † Nouveaux Voy. des Iſles, tom. iv. p. 165.

not ſo thick as thoſe of the other Negroes; and their features very much reſemble thoſe of the Europeans*.

In certain provinces of Congo, they have very ſingular cuſtoms. When a perſon dies in Loango, for example, they place the corpſe on a kind of amphitheatre, raiſed about ſix feet above the ground, and in a ſitting poſture, with the hands reſting on the knees. They dreſs him in his beſt garments, and then kindle fires all round the body. In proportion as the clothes abſorb the moiſture, they cover him with freſh garments, till the body be perfectly dry; after which they bury him with great pomp. In the province of Malimba, the wife ennobles the huſband. When the King dies and leaves only a ſingle daughter, if ſhe has arrived at the age of puberty, ſhe becomes abſolute miſtreſs of the kingdom. She begins her reign by making a tour round her dominions. In all the towns and villages through which ſhe paſſes, the whole men are obliged to appear before her, immediately upon her arrival, and ſhe chooſes the man whom ſhe fancies moſt, to paſs the night with her. At her return from her journey, ſhe ſends for the man who has been ſo fortunate as to pleaſe her beſt, and inſtantly marries him. After marriage her power terminates, and devolves entirely on her huſband. Theſe facts I have ex-

* See Indiæ Orient. par. i. p. 5. and Drake's Voyage, p. 110.

tracted

tracted from M. de la Broſſe's travels along the coaſt of Angola in the year 1738. He adds a fact not leſs ſingular. 'Theſe Negroes,' ſays he, 'are extremely vindictive, of which I ſhall 'give a convincing proof. They daily demand- 'ed of us ſome brandy for the uſe of the King 'and chief men of the town. One day this re- 'queſt was denied, and we had ſoon reaſon to 'repent it; for all the French and Engliſh of- 'ficers having gone a fiſhing on a ſmall lake 'near the ſea-coaſt, they erected a tent for the 'purpoſe of dreſſing and eating the fiſh they 'had caught. When they were amuſing them- 'ſelves after their repaſt, ſeven or eight Negroes, 'who were the chiefs of Loango, arrived in ſe- 'dans, and preſented their hands, according to 'the cuſtom of the country. Theſe Negroes 'privately rubbed the officers hands with a ſub- 'tile poiſon, which acts inſtantaneouſly; and, 'accordingly, five Captains and three ſurgeons 'died on the ſpot,' &c.

When the Negroes of Congo have a pain in their head, or any other place of the body, they make a ſmall wound in the place affected, and apply to it a ſmall horn with a hole in its mid- dle, by means of which they ſuck out the blood till the pain abates *.

The Negroes of Senegal, of Gambia, of Cape de Verd, of Angola, and of Congo, are of a finer black than thoſe of the coaſts of Juda, Iſ-

* Pigafetta, p. 51.

ſigni, Arada, and the adjacent provinces. When in health, they are all black; but, when ſick, they become yellowiſh, or copper-coloured *. In the French iſlands, the Negroes of Angola are preferred, for their ſtrength, to thoſe of Cape de Verd: But, when heated, they ſmell ſo rank, that the places they paſs through are infected with the ſtench for more than a quarter of an hour. The Cape de Verd Negroes do not ſmell ſo ſtrong as thoſe of Angola: They have alſo a finer and blacker ſkin; they are better made; their features are ſofter; their diſpoſitions are more gentle, and their ſtature is more commodious †. The Negroes of Guiney are very proper for cultivating the ground and other laborious offices. Thoſe of Senegal are not ſo ſtrong; but they are more ingenious, and better adapted for domeſtic ſervices ‡. Father Charlevoix tells us, that the Senegal Negroes are the moſt handſome, moſt docile, and beſt ſuited for domeſtic uſes; that the Bambaras are larger, but that they are all rogues; that the Aradas are beſt acquainted with the culture of the earth; that the Congos are the ſmalleſt in ſize, and excellent fiſhers, but that they are much addicted to deſertion; that the Nagos are the moſt humane, the Mondogos the moſt cruel, the Mimes the moſt reſolute, moſt capricious, and moſt ſubject to deſpair; and that the Creol Negroes,

* Nouveaux Voy. aux Iſles de l'Amerique, tom. iv. p. 138.
† L'Hiſt. des Antilles, par le Pêre du Tertre, p. 493.
‡ Nouveaux Voy. aux Iſles, tom. iv. p. 116.

from

from whatever nations they derive their origin, retain nothing of their parents but the colour and the ſpirit of ſlavery. They are more ingenious, rational, and dexterous, but more ſlothful and debauched, than the African Negroes. He adds, that the genius of all the Guiney Negroes is extremely limited; that ſome of them appear to be perfectly ſtupid, not being able to count beyond the number of three; that they never think ſpontaneouſly; that they have no memory, the paſt and the future being equally unknown to them; that the moſt ſprightly of them have ſome humour, and make tolerable mimics; that they are extremely cunning, and would rather die than tell a ſecret; that, in general, they are gentle, humane, docile, ſimple, credulous, and even ſuperſtitious; and that they are faithful and brave, and, if properly diſciplined, would make good ſoldiers *.

Though the Negroes have little genius, their feelings are extremely acute. According to the manner they are treated, they are gay or melancholy, laborious or ſlothful, friends or enemies. When well fed, and not maltreated, they are contented, joyous, ready for every employment, and the ſatisfaction of their mind is painted in their countenance. But, when oppreſſed and abuſed, they grow peeviſh, and often die of melancholy. Of benefits and of abuſe, they are exceedingly ſenſible, and againſt thoſe who

* *Hiſt. de St. Dominique, par le Pêre Charlevoix.*

 injure

injure them they bear a mortal hatred. On the other hand, when they contract an affection to a master, there is no office, however hazardous, which they will not boldly execute, to demonstrate their zeal and attachment. They are naturally affectionate, and have an ardent love to their children, friends, and countrymen *. The little they possess they freely distribute among the necessitous, without any other motive than that of pure compassion for the indigent.

Upon the whole, it is apparent, that the unfortunate Negroes are endowed with excellent hearts, and possess the seeds of every human virtue. I cannot write their history, without lamenting their miserable condition. Is it not more than enough to reduce men to slavery, and to oblige them to labour perpetually, without the capacity of acquiring property? To these, is it necessary to add cruelty, and blows, and to abuse them worse than brutes? Humanity revolts against those odious oppressions which result from avarice, and which would have been daily renewed, had not the laws given a friendly check to the brutality of masters, and fixed limits to the sufferings of their slaves. They are forced to labour; and yet the coarsest food is dealt out to them with a sparing hand. They support, say their obdurate task-masters, hunger without inconvenience; a single European meal is sufficient provision to a Negro for three days;

* Hist. des Antilles, p. 483.

however little they eat or sleep, they are always equally strong, and equally fit for labour *. How can men, in whose breasts a single spark of humanity remains unextinguished, adopt such detestable maxims? How dare they, by such barbarous and diabolical arguments, attempt to palliate those oppressions which originate solely from their thirst of gold? But let us abandon those hardened monsters to perpetual infamy, and return to our subject.

Of the inhabitants of the coasts and of the interior parts of Africa, from Cape Negro to Cape de Voltes, an extent of about 400 leagues, we have no knowledge. We only know that these men are less black than the other Negroes, and that they resemble the Hottentots, with whom they border on the south. The Hottentots, on the contrary, are well known, and described by almost every voyager. They are not Negroes, but Caffres, and would be of a tawny colour only, if they did not blacken their skin with grease and paint. M. Kolbe, who has given a very accurate description of these people, regards them, however, as Negroes. He assures us, that they have all short, black, frizled, woolly hair; and that he never saw a single Hottentot with long hair †. But this circumstance is not sufficient to make us consider them as genuine Negroes. In the first place, their colour is totally

* Hist. de St. Dominique, p. 468. † Descript. du Cap de Bonne Esperance, par M. Kolbe, p. 95.

different;

different; for M. Kolbe tells us, that they are olive, and never black, though they employ every method to darken their ſkin. In the next place, it ſeems to be equally difficult to pronounce concerning their hair; for they never either comb or waſh it, but daily rub on their heads vaſt quantities of greaſe, ſoot, and duſt, which make their hair reſemble a fleece of wool ſtuffed with dirt*. Beſides, their diſpoſitions are different from thoſe of the Negroes. The latter are ſedentary, love cleanlineſs, and are eaſily reconciled to ſervitude. The Hottentots, on the contrary, are a wandering independent people, frightfully naſty, and extremely jealous of their liberty. Theſe differences are more than ſufficient to convince us that the Hottentots are not of the ſame race with the Negroes.

Gama, who firſt doubled the Cape of Good Hope, arrived in the bay of St. Helena on the 4th of November 1497. He deſcribes the inhabitants as being black, of ſmall ſtature, and having a very diſagreeable aſpect: But he ſays not that they were naturally black like the Negroes; and, doubtleſs, they only ſeemed black to him by the greaſe and ſoot with which they are perpetually covered. This voyager adds, that the ſound of their voice reſembled ſighing; that they were clothed in the ſkins of beaſts; and that their arms were bludgeons hardened with the fire, and pointed with the horn of ſome animal †. It is

* Deſcript. du Cap de Bonne Eſperance, par M. Kolbe, p. 92.
† Hiſt. Gen. des Voy. par l'Abbé Prevot, tom. i. p. 22.

apparent,

apparent, therefore, that the Hottentots practiſe no arts in common with the Negroes.

We are informed by the Dutch voyagers, that the ſavages to the north of the Cape are ſmaller than the Europeans; that their colour is a reddiſh brown; that they are extremely ugly, and endeavour to increaſe their blackneſs with paint; and that their hair reſembles that of a man who has hung long on a gibbet *. In another place, they tell us, that the Hottentots are of the colour of Mulattoes; that their viſage is greatly deformed; that they are of a middle ſize, but meagre, and exceedingly nimble in the chaſe; and that their language reſembles the clucking of a Turkey cock †. Father Tachard ſays, that though, in general, their hair be woolly like that of the Negroes; yet many of them have long hair, which floats upon their ſhoulders. He even adds, that ſome of them are as white as Europeans, but that they blacken their ſkin with greaſe, and the powder of a certain black ſtone; and that their women are naturally fair; but, to pleaſe their huſbands, they paint themſelves black ‡. Ovington tells us, that the Hottentots are more tawny than the other Indians; that no people reſemble the Negroes more in colour and features, but that they are not ſo black; and their hair is not ſo criſped, nor their noſe ſo flat ‖.

* Voy. de la Comp. de Hollande, p. 218. † Voyages de Spitſberg, p. 443. ‡ Le premier Voy. du Pêre Tachard, p. 108. ‖ Voy. d'Ovington, p. 194.

From

From all theſe teſtimonies, it is plain that the Hottentots are not true Negroes, but blacks beginning to approach towards whiteneſs, as the Moors are whites approaching to blackneſs. Theſe Hottentots, moreover, are a very ſingular ſpecies of ſavages. Their women, who are commonly much leſs than the men, have a kind of excreſcence, or hard broad ſkin, which originates above the os pubis, and deſcends, like an apron, to the middle of their thighs*. Thevenot ſays the ſame thing of the Egyptian women, but that, inſtead of allowing this excreſcence to grow, they burn it off with hot irons. With regard to the women of Egypt, the fact is very doubtful. But it is certain that all the women who are natives of the Cape are ſubject to this monſtrous deformity, which they uncover to thoſe who have the curioſity to look at it. The men are all half eunuchs, not naturally, but by an abſurd cuſtom of cutting out one of the teſticles about the age of eight years. M. Kolbe ſaw this operation performed on a young Hottentot. The circumſtances with which this ceremony is accompanied are ſo ſingular that they deſerve to be recited.

After rubbing the young man with greaſe taken from the entrails of a ſheep which is ſlain for the purpoſe, they lay him on his back on the ground, tie his hands and his feet, and three or four of his friends hold him. Then the prieſt,

* See Deſcript. du Cap, par M. Kolbe, tom. i. p. 91. and Voyage de Courlai, p. 294.

(for

(for it is a religious rite), armed with a sharp knife, makes an incision, and cuts away the left testicle *, and puts in its place a ball of grease of the same size, prepared with some medicinal herbs. He then sews up the wound with the bone of a small bird, which serves for a needle, and a thread made of the tendon of a sheep. The operation being thus finished, the patient is untied. But the priest, before quitting him, rubs him all over with the warm grease of a new-killed sheep, or rather pours the grease upon him so copiously, that, when cool, it forms a kind of crust. At the same time, he rubs him so roughly, that the young man, who has already suffered too much, is covered with sweat, and fumes like a capon on a spit. The operator next makes furrows with his nails in this crust of grease, from one end of the body to another, and then pisses in them. After which, he again rubs the patient, and fills up the furrows with fresh grease. The young man is now instantly abandoned, and left alone in a condition rather resembling death than life: He is obliged to crawl, in the best manner he can, into a hut purposely erected near the place where the operation is performed. There he either perishes or recovers, without assistance, or any other nourishment than the grease that covers him, and which he may lick, if he chooses. At the end of two days, he generally recovers, comes

* Tavernier says it is the right, tom. iv. p. 297.

out of his hut, and presents himself to his friends: And to prove that he is perfectly cured, he runs before them with the swiftness of a stag *.

All the Hottentots have broad flat noses, which would not be the case, if their mothers did not flatten them immediately after birth; for they regard a prominent nose as a great deformity. They have also very thick lips, white teeth, bushy eye-brows, large heads, meagre bodies, and small limbs. They seldom live above 40 years. The short duration of their lives is unquestionably occasioned by the nastiness in which they perpetually wallow, and the putrid flesh on which they chiefly feed. As most travellers have written fully concerning the manners of this dirty people †, I shall only add one fact more, which is related by Tavernier. The Dutch, says he, carried off a Hottentot girl a few days after her birth, brought her up among themselves, and she soon became as white as any European. From this fact he concludes, that all the Hottentots would be equally fair, if they did not perpetually daub themselves with dirt and black paints.

Along the African coast, beyond the Cape of Good Hope, we meet with the territory of Natal,

* Descript. du Cap, par M. Kolbe, p. 275.

† The reader may consult the following voyagers: Kolbe; Voy. de la Comp. Holl.; Robert Lade, tom i. p. 88; Ovington; Loubere, tom. ii. p. 134.; Tachard, p. 95.; Biervillas, par. i. p. 34.; Tavernier, tom. iv. p. 296.; Francis Leguat, tom. ii. p. 154.; Dampier, tom. ii. p. 255, &c.

the inhabitants of which differ greatly from the Hottentots. They are better ſhade, and leſs ugly. They are likewiſe naturally bl[illegible] viſage is oval, their noſe well proportioned, and their teeth are white; their aſpect is agreeable, and their hair is naturally criſped. But, like the Hottentots, they have ſome taſte for greaſe; for they wear bonnets made of the tallow of oxen. Theſe bonnets are from eight to ten inches high, and they ſpend a good deal of time in preparing them: For this purpoſe, the tallow muſt be well refined; they apply but little of it at a time, and mingle it ſo completely with their hair, that it never falls off *. M. Kolbe alledges, that their noſes are flat from their birth, and that they uſe no arts to flatten them; that they do not ſtammer, or ſtrike the palate with their tongue, like the Hottentots; that they build houſes, cultivate the ground, and ſow a ſpecies of maiſe or Turkiſh corn, of which they make ale, a drink unknown to the Hottentots †.

Beyond the te[illegible]ory of Natal, we meet with thoſe of Sofala and M[illegible]tapa. According to Pigaſetta, the people of Sofala are black, but taller and thicker than the other Caffres. This author places the Amazones in the neighbourhood of the kingdom of Sofala ‡. But nothing can be more uncertain than what has been affirmed with regard to thoſe female warriors. The na-

* Dampier, tom. ii. p. 393. † Deſcrip. du Cap, tom. i. p. 136. ‡ See Indiæ Orient. par. 1. p. 54.

tives

tives of Monomotapa, ſay the Dutch travellers, are tall, handſome, black, and have fine complexions. The young girls go naked, wearing only a thin piece of cotton ſtuff upon their middle; but put on garments as ſoon as they get huſbands. Theſe people, though very black, are different from the Negroes. Their features are neither ſo coarſe nor ſo ugly; their bodies have no bad ſmell; and they can neither ſupport ſervitude nor hard labour. Father Charlevoix tells us, that he has ſeen blacks of Monomotapa and Madagaſcar in America; but that they could never be trained to labour, and ſoon periſhed *.

The natives of Madagaſcar and of Moſambique are more or leſs black. The inhabitants of Madagaſcar have the hair on the crown of their heads not ſo much criſped as thoſe of Moſambique. Neither of them are true Negroes; and, though thoſe on the coaſt are very ſubmiſſive to the Portugueſe, the people in the interior parts of the continent are extremely ſavage, and jealous of their liberty. Both men and women go perfectly naked: they eat the fleſh of elephants, and ſell the ivory to ſtrangers †. Madagaſcar is chiefly inhabited by blacks and whites, who, though very tawny, ſeem to be a different race of men. The hair of the former is black and

* Hiſt. de St. Dominique, p. 499.

† See Recueil des Voyages, tom. iii, p. 623.; Le Voy. de Moquet, p. 265.; et La Navigation de Jean Hugues Lintſcot, p. 20.

criſped;

criſped; that of the latter is fairer, leſs frizzled, and longer. It is a common opinion, that the whites derive their origin from the Chineſe. But Francis Cauche properly remarks, that they ſeem to be of European extraction; for he aſſures us, that all of them he ſaw had neither flat faces nor noſes, like the Chineſe. He likewiſe ſays, that theſe whites are fairer than the Caſtillans; that their hair is long; that the blacks are not flat-noſed like thoſe on the continent; and that their lips are thin. In this iſland there are alſo many perſons of an olive or tawny colour, who probably proceed from a mixture of the blacks and whites. The ſame traveller informs us, that the inhabitants round the bay of St. Auguſtine are tawny; that they have no beard; that their hair is long and ſmooth; that they are tall and handſome; and, laſtly, that they are all circumciſed, though they probably never heard of the law of Mahomet, for they have neither temples, moſques, nor religion *. The French firſt landed and eſtabliſhed a ſettlement on this iſland; but the ſettlement was not ſupported †. When they arrived, they found the white men above deſcribed; and they remarked, that the blacks had a great reſpect for theſe whites ‡. The iſland of Madagaſcar is extremely populous, and abounds in cattle and paſturage. Both men and women are exceedingly debauched; and

* Voyage de François Cauche, p. 45. † Voy. de Flacour.
‡ Voy. de M. Delon.

public proſtitution is not followed with diſho-nour. They love dancing, ſinging, and ſimilar amuſements. Though indolent, they have ſome knowledge of the mechanic arts; and, though they have no moveables in their houſes, but lie upon mats, they have huſbandmen, ſmiths, carpenters, potters, and even goldſmiths. They eat their meat almoſt raw, and devour the ſkins of their oxen, after ſinging the hair; they likewiſe eat the wax with the honey. The common people go almoſt naked; but the more opulent wear drawers or petticoats of cotton and ſilk *.

The natives of the interior parts of Africa are too little known to admit of deſcription. Thoſe called *Zingues* by the Arabians, are black, and almoſt perfectly ſavage. Marmol tells us, that they multiply prodigiouſly, and would over-run the adjacent country, if numbers of them were not ſwept off from time to time, by a great mortality, occaſioned by hot winds.

Upon the whole, it appears that the Negroes are a different ſpecies of blacks from the Caffres. But, from the deſcriptions we have given, it is ſtill more apparent, that the differences of colour are produced by the climate; and that the peculiarities in features depend much upon the cuſtoms which take place among different nations; ſuch as, flattening the noſe, pulling the hair off the eye-brows, lengthening the ears,

* Le Voyage de Flacour, p. 90.; Struys, tom. i. p. 32.; Pyrard, p. 38.

thickening

thickening the lips, making the face broad, &c. Nothing can be a ſtronger proof of the influence of climate upon colour, than to find, under the ſame latitude, and diſtant from each other more than 1000 leagues, people ſo ſimilar as the Nubians and natives of Senegal; and to find, that the Hottentots, who muſt have originated from a black race, are the whiteſt people in Africa, for no other reaſon but becauſe their country is the coldeſt. If the tawny nation on one ſide of the river Senegal, and the perfect blacks on the other, occur as an objection, I muſt refer to what was above remarked concerning the effects of food, which has a great influence on colour, as well as many other cuſtoms and modes of living: And, if an example be demanded, I ſhall produce one from the brute creation, which every man is in a condition to verify. The fleſh of the hares that live in the plains and moiſt grounds, is whiter than that of thoſe which inhabit mountainous or dry regio[illegible] the ſame part of the [illegible]try, thoſe whi[illegible] feed in the meadows are perfectly d[illegible]ent from thoſe that dwell on the hills. The colour of the fleſh proceeds from that of the blood and other humours of the body, the qualities of which neceſſarily depend on the nature of the food.

The origin of black men has, at all times, been an object of inquiry. The ancients, who knew only thoſe of Nubia, regarded them as the laſt or terminating ſhade of the tawny colour,

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and confounded them with the Ethiopians, and other African nations, who, though extremely brown, belong more to the white than to the black race. They thought that the differences of colour among the human ſpecies proceeded ſolely from the varieties of climate, and that blackneſs was occaſioned by a perpetual expoſure to the hot rays of the ſun. This opinion, though very probable, was much weakened, after it was diſcovered that the inhabitants of more ſouthern climates, and even under the Equator itſelf, as thoſe of Melinda and Moſambique, were not black, but very tawny; and when it was farther diſcovered, that blacks tranſported into more temperate climates, loſt nothing of their original hue, but communicated it to their deſcendants. If we attend, however, to the migrations of different people, and to the time neceſſary to produce a change in their colour, we ſhall, perhaps, find the opinion of the [illegible] to [illegible] been well founded; for the natives of this part of A[illegible] Nubians, and will preſerve their original blackneſs as long as they continue to live under the ſame climate, and mix not with the whites. But the Ethiopians, the Abyſſinians, and even the natives of Melinda, though they derive their origin from the whites, their religion and cuſtoms being the ſame with thoſe of the Arabians, are, however, more tawny than the inhabitants of the ſouthern parts of Arabia. This circumſtance alone evinces, that,

even

even among the fame race of men, the different degrees of blacknefs depend, more or lefs, upon the heat of the climate. Many ages are, perhaps, neceffary to change the white colour into perfect blacknefs; but it is probable, that, in a fucceffion of generations, a white people, tranfported from the north to the Equator, would undergo this change, efpecially if they adopted the manners, and ufed the food, of the new country.

The objection drawn from the difference of features is not unfurmountable; for the features of a Negro, who has not been purpofely deformed in his infancy, differ not more from thofe of an European, than a Tartar differs from a Chinefe, or a Circaffian from a Greek: And, with regard to the hair, the nature of it depends fo much on the quality of the fkin, that any differences which take place in it ought to be confidered as merely accidental; for, in the fame country, and even in the fame village, we find every poffible variety of hair. In France, for example, there are fome men whofe hair is as fhort and as crifped as that of a Negro: Befides, heat and cold have great influence upon the colour of the hair both of men and other animals. In the northern regions, black hair is feldom or never feen: And fquirrels, hares, weafels, and feveral other animals, are white in the north, but brown or grey in more fouthern latitudes. The effects produced by cold and heat are even

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ſo remarkable, that, in Sweden, certain animals, as the hares, are grey during the ſummer, and perfectly white in winter *.

But the New World affording no examples of true Blacks, is the ſtrongeſt argument againſt my hypotheſis; and it appears, at firſt ſight, to be almoſt inſuperable. If blackneſs were the effect of heat alone, why do we not find Negroes or black men in the Antilles, in Mexico, in Santa-fé, in Guiana, in the country of the Amazones, or in Peru; ſince theſe countries of America are ſituated under the ſame latitude with Senegal, Guiney, and Angola in Africa? If the different colours of the human ſpecies were occaſioned by the climate, or the diſtance from the Pole, we ſhould have found, in the Braſils, in Paraguay, or in Chili, men ſimilar to the Caffres and Hottentots. But, before attempting to remove this objection, it is neceſſary to give a ſhort deſcription of the various American na[illegible]; after wh[illegible]ch we ſhall be the more qu[illegible]fied to make ju[illegible] com[illegible]ns, and to draw general concluſ[illegible].

In the moſt northerly regions of America, we find a ſpecies of Laplanders, ſimilar to thoſe of Europe, or to the Samoiedes of Aſia. Though their numbers are few, they are ſpread over a large extent of country. Thoſe who live round Davis's Straits are ſmall, of an olive colour, and

* Lepus apud nos æſtate cinereus, hieme ſemper albus; Linnæi Faun. Suec. p. 8.

have

have ſhort thick limbs. They are excellent fiſhers, and eat their meat and fiſh raw. Their drink is pure water, or the blood of the ſea-dog. They are very robuſt and long-lived*. Theſe are exactly the figure, colour, and manners of the Laplanders: And, what is ſingular, as the Fins, who are adjacent to the European Laplanders, are white, beautiful, and pretty large and handſome; ſo, in the neighbourhood of the American Laplanders, we find a ſpecies of men who are tall, handſome, pretty white, and poſſeſſed of very regular features†. The ſavages along Hudſon's Bay, and to the north of Labrador, though they are ſmall, ill made, and ugly, appear not to be of the ſame race with the former. Their viſage is almoſt entirely covered with hair, like the ſavages of the lands of Jeſſo, to the north of Japan. In ſummer, they dwell in tents made of the ſkins of the rein-deer; and, in winter, they live under ground, like the Laplanders and Samoiedes, where they lie promiſcuouſly, and without ceremony. Though their food conſiſts only of raw fleſh and fiſh, they are very long-lived‡. The ſavages of Newfoundland reſemble thoſe of Davis's Straits. They are of ſmall ſtature, have little or no beard, broad faces, large eyes, and generally flat noſes. The traveller who gives this deſcription adds, that they

* Hiſt. Nat. des Iſles, p. 189. † Ibid. ‡ Voyage de Rob. Lade, tom. ii. p. 309.

have a great ſimilarity to the ſavages in the environs of Greenland *.

To the ſouth of theſe ſavages, who are ſpread over the northern regions of America, we meet with a different and more numerous race, who occupy Canada, and the adjacent territories, as far as the Aſſiniboils. They are large, ſtrong, well made, and all of them have black hair, black eyes, very white teeth, a ſwarthy colour, little beard, and hardly any hair on their bodies. They are indefatigable in travelling, and extremely nimble in the chaſe. With equal eaſe they can ſupport hunger, and the greateſt exceſs in eating. They are hardy, bold, grave, and moderate: In a word, they have ſo ſtrong a reſemblance, both in their external appearance, and in their manners and diſpoſitions, to the oriental Tartars, that, if they were not ſeparated by a vaſt ſea, we ſhould believe them to have ſprung from the ſame nation. They alſo live under the ſame latitude; which is a farther proof of the influence of climate upon the figure and colour of the human ſpecies. To conclude, in the northern extremities of the New Continent as well as in thoſe of the old, we firſt find men ſimilar to the Laplanders, and likewiſe a race of whites with fair hair, like the inhabitants of the north of Europe; then hairy men reſembling the ſavages of Jeſſo; and, laſtly, the ſavages of Canada, who occupy the whole territory as far

* Recueil des Voyages au Nord. tom. iii. p. 7.

as the Gulf of Mexico, and so strongly resemble the Tartars, that, if there were no embarrassment concerning the possibility of their migration, we should conclude them to be the very same people. However, if we attend to the small number of men scattered over the immense territories of North America, and their universal want of civilization, we must admit that all these nations of savages have been peopled by the escape of individuals from some more numerous race. Though we should allow the number of natives to be now reduced to a twentieth part of what they were on the first discovery of America, still this country was, even then, so thinly inhabited, that it must be considered as a desert, or a land, so recently peopled, that the men had not time sufficient for an extensive multiplication. M. Fabry *, who penetrated farther into the interior parts of this country, to the northwest of the Mississippi, than any other man had done, and where, of course, the savages could not have suffered any diminution by the inroads of the Europeans, assures us, that he often travelled in this region 200 leagues without seeing a human face, or any marks which indicated the adjacent country to be inhabited; and that, when he did meet with any Indian huts, they were always at least 100 leagues distant from each other, and seldom contained above 20 persons. Along the banks of rivers and lakes, it is true, the savages

* Hist. Nat. gen. et particul. tom. i. p. 340.

are

are more numerous, and ſome of them are even troubleſome to our coloniſts. But theſe nations ſeldom exceed three or four thouſand perſons, and are ſpread over a country often more extenſive than the kingdom of France: So that I am perſuaded there are more men in Paris than all the natives of North America, from the Gulf of Mexico to the Northern Ocean, though this territory is much larger than Europe.

Population depends more on ſociety than Nature. Men would not be comparatively ſo numerous as the ſavage animals, if they were not united, and derived not mutual aid and ſuccour from ſociety. In North America, the biſons * are perhaps more abundant than the men. But, though population be a reſult of ſociety, it is the increaſed number of men which neceſſarily produces their unity. We may, therefore, preſume, that the want of civilization in America is owing to the paucity of its inhabitants; for, though each nation had peculiar cuſtoms and manners; though ſome were more ſavage, cruel, and daſtardly than others; yet they were all equally ſtupid, ignorant, and deſtitute of arts and of induſtry.

I have run, perhaps, into too great a detail concerning the manners of ſavage nations. Moſt authors have miſtaken the particular actions of individuals, which often reſult from caprice or unknown circumſtances, for the general and

* A ſpecies of wild ox.

eſtabliſhed

eſtabliſhed manners of a nation. Some people, they tell us, eat their enemies; others burn or maim them; ſome delight in war; others love peace. Some kill their parents after they arrive at a certain age; among others, the fathers and mothers eat their own children. Theſe, and ſimilar narrations, ſo much delighted in by travellers, are reducible to ſingle facts, and import no more, than that one individual ſavage eat his enemy, another burnt or maimed him, and a third killed or eat his own child. All theſe examples may be found in every ſavage nation; for a people who live without the reſtraint of fixed laws, or of a regular government, can only be conſidered as a tumultuous aſſemblage of barbarous and independent individuals, who obey no laws but thoſe of paſſion and caprice, and who, having no common intereſt, are incapable of purſuing any determined ſtandard of manners, which ſuppoſes general views that have obtained the ſanction both of time and a majority of numbers.

A nation, it may be ſaid, is compoſed of men who are known to each other, who ſpeak the ſame language, who unite, when neceſſary, under the ſame chief, who uſe the ſame arms, and who paint themſelves with the ſame colours: To this we might ſubſcribe, without difficulty, if theſe manners were conſtant and uniform; if the people did not often unite and ſeparate without deſign; if their chief loſt not all authority by

by their caprice or his own; and if their language was not so simple as to be almost common to every tribe.

As they have but few ideas, their expressions are limited to the most common objects; and, though every mode of expression should differ from another, yet the smallness of their number necessarily renders them of easy acquisition. It is not, therefore, so difficult for a savage to learn the language of all other savages, as for a polished man to learn the language of another people equally advanced in civilization.

But it is, perhaps, of more importance to examine the nature of the individual savage, than to enlarge upon the manners and customs of these pretended nations. Of all animals, a savage man is the most singular, the least known, and the most difficult to describe. We are so ill qualified to distinguish the genuine gifts of Nature from what is acquired by education, art, and imitation, that it would not be surprising if we should totally mistake the real portrait of a savage, though the natural colouring and features of his character were faithfully represented to us.

An absolute savage, such as the boy brought up by the bear, described by Conor *, the young man found in the forest of Hanover, or the girl discovered in the woods of France, would be a curious object to a philosopher, by the contemplation of which he might estimate the force of

* Evang. Med. p. 133.

natural

natural appetites: Here he would ſee the mind perfectly naked: he might diſtinguiſh all its movements; he might perhaps diſcover in it more ſweetneſs and tranquillity than in his own; he might, perhaps, clearly perceive, that virtue is more natural to the ſavage than to the civilized, and that vice derives its origin and ſupport from ſociety alone.

But to return to our ſubject: If North America affords only ſavages, Mexico and Peru preſent us with a poliſhed people, governed by laws, and ſubject to regal eſtabliſhments. They had induſtry, arts, and a ſpecies of religion. They dwelt in cities, where order and police were maintained by the authority of the ſovereign. Theſe people, who were very numerous, cannot be conſidered as new nations, or as originating from individuals who had eſcaped from Europe or Aſia, from whom they are ſo remote. Beſides, if the ſavages of North America, becauſe they are ſituated under the ſame latitude, reſemble the Tartars, the people of Mexico and Peru, though, like the Negroes, they live under the Torrid Zone, have no ſimilarity to them. What then is the origin of theſe people? and what cauſe can be aſſigned for the difference of colour in the human ſpecies, ſince the influence of climate is inſufficient, in this caſe, to ſolve the phænomenon?

Before anſwering theſe queſtions, we muſt continue our deſcription of the ſavages of South America. Thoſe of Florida, of the Miſſiſippi, and

and of the more ſoutherly regions, though not abſolutely brown, are more tawny than the Canadians. The oil and paint with which they rub their bodies, render their colour unnaturally olive. Coreal tells us, that the women of Florida are tall, ſtrong, and, like the men, of an olive colour; that they paint their arms, limbs, and body, with ſeveral colours, which remain for ever, becauſe they are engrained in the ſkin by means of puncturing; that the olive colour of both ſexes proceeds not ſo much from the heat of the climate, as from the oil with which they varniſh their ſkin: He adds, that the women are extremely active; that, with an infant in their arms, they ſwim acroſs large rivers; and that, with equal agility, they climb the higheſt trees*. All theſe qualities they poſſeſs in common with the Canadians and other ſavages of America. The author of the Natural and Moral Hiſtory of the Antilles remarks, that the Apalachians, a people bordering on Florida, are tall, well-ſhaped, and of an olive colour; and that they all have long black hair: He adds, that the Caribbees, who inhabit the Antilles, have ſprung from the ſavages of Florida; and that the time of their migration has been handed down by tradition †.

The natives of the Lucai iſlands are leſs tawny than thoſe of St. Domingo and Cuba. But ſo

* See le Voy. de Coreal, tom. i. p. 36.

† Hiſt. Nat. des Iſles Antilles, p. 35.

few of either now remain, that the relations of the first voyagers to these countries can derive no support from them. These people, it has been alleged, were very numerous; that they were governed by a kind of chiefs, called Caciques; and that they had priests and physicians. But all this is problematical, and, besides, has no connection with our history. The Caribbees, in general, says Father du Tertre, are tall, and have a pleasant aspect; they are strong, robust, active, and healthy; some of them have flat visages and depressed noses: These features, however, are not natural to them, but artificially induced by their parents soon after birth. This capricious practice of altering the natural figure of the head is very general among savage nations. Most of the Caribbees have small black eyes, white teeth, and long, smooth, black hair. Their colour is tawny or olive; and this colour is natural to them, and not the effect of painting, as some authors have maintained; for the colour of such of their children as have been trained up among Europeans, and not allowed the use of paint, was precisely the same with that of their parents. All these savages, though they never think, have a pensive melancholy aspect. Though cruel to their enemies, they are naturally mild and compassionate. They marry indifferently, either their own mother, or strangers. Their cousins-german belong to them by law; and several of them have been known to possess, at the same time,

time, two sisters, or the mother and the daughter, and even their own daughter. Those who have several wives visit them alternately for a month, or a stated number of days, which extinguishes jealousy among the women. They easily pardon adultery in their wives; but they never forgive him who debauches them. They feed upon crabs, turtles, lizards, serpents, and fishes, which they season with pimento and the flour of manioc*. Being extremely indolent, and accustomed to the most unbounded independence, they detest servitude, and never can be trained to labour like the Negroes. To preserve their liberty, they exert every effort; and, when they find it impracticable, they, rather than work, choose to die of hunger, or of chagrin. The Arrouaguas, who are milder than the Caribbees, are sometimes employed; but it is only in fishing or hunting, exercises of which they are naturally fond, and to which they have been accustomed in their own country. If these savages are to be retained as slaves, they must be treated with as much gentleness as domestic servants, otherwise they will desert, or perish with melancholy. The Brasilian slaves have nearly the same disposition, though they seem to be less stupid, indolent, and melancholy, than any other American savages. However, when treated with gentleness, they may be trained to any operation, except that of cultivating the ground,

* Hist. gen. des Antilles, par du Tertre, tom. ii. p. 453. &c.

ground, which they consider as the characteristic badge of slavery.

Savage women are always smaller than the men. The Caribbee females are fat, and tolerably handsome. Their hair and eyes are black; their visage is round, their mouth small, their teeth white; their air is more open, gay, and lively, than that of the men; and they are modest and reserved. They daub themselves with paint; but they do not use the black strokes upon the face and other parts of the body, as is customary with the men. They wear only a small apron, made of cotton, studded with beads, about eight or ten inches broad, by five or six long. This stuff they purchase of the Europeans; and, beside the apron, they use collars of the same cloth round their necks, which hang down upon their bosoms. They likewise wear bracelets of this stuff on their wrists and arms, and ear-rings made of a blue stone, or of strings of beads. The last ornament peculiar to the women is a kind of buskin of cotton studded with beads, which extends from the ankle to the calf of the leg. As soon as the girls arrive at the age of puberty, they are furnished with an apron and buskins, the latter of which are made so tight, that they cannot be removed; and, as they prevent the under part of the leg from thickening, the upper parts grow larger and stronger than they would naturally do*.

* Nouv. Voy. aux Isles, tom. ii. p. 8.

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The inhab'tants of Mexico and Peru are ſo mixed, that it is difficult to find two faces of the ſame colour. In the town of Mexico, there are Europeans, Indians from North and South America, African Negroes, Mulattoes, and mongrels of every kind; ſo that we ſee men there of every ſhade between black and white *. The natives of the country are brown or olive, well-made, and nimble. They have little hair, even on their eye-brows; but that on their head is very long and very black †.

The natives of the Iſthmus of America are, as Wafer remarks, generally of a good ſtature and ſhape. They have elegant limbs, a full cheſt, and are extremely active and fleet in the chaſe. The women are little and ſquat; and though, when young, they are jolly, and have brilliant eyes; yet they poſſeſs not equal vivacity with the men. Both men and women have round faces, ſhort flat noſes, large eyes, moſtly of a gray colour, and full of fire, high fore-heads, white teeth, thin lips, mouths of a middle ſize, and, in general, a very regular ſet of features. They all have long, black, ſtraight hair; and the men would have beards, if they did not pull out the hairs. Their colour is tawny; and their eye-brows are as black as jet.

But theſe are not the only natives of this Iſthmus; for we find among them a ſpecies of

* Lettres Edifiantes, recueil xi. p. 119.
† Voy. de Coreal, tom. i. p. 116.

white

white men, whoſe colour reſembles not that of the Europeans, but their whiteneſs is ſimilar to that of milk, or to the hairs of a white horſe. Their ſkin is covered with a kind of ſhort white down, which is not ſo thick upon the cheeks and fore-head as to conceal the ſkin. Their eye-brows are perfectly white, as well as their hair, which is ſeven or eight inches long, and half criſped. Theſe Indians are not ſo tall as the others; and, what is ſingular, their eye-lids are oblong, or rather in the form of a creſcent, with the points turned down. Their eyes are ſo weak, that they can hardly ſee any object during the day; they cannot ſuffer the rays of the ſun, and have no diſtinct viſion but from the light of the moon. Their complexion is extremely delicate; they have an abhorrence at all hard labour; they ſleep during the day, and never go abroad but in the night. When the moon ſhines, they run through the deep ſhades of the foreſts with as much freedom and nimble-neſs as other men do in the cleareſt day. Upon the whole, theſe men are neither ſo robuſt nor vigorous as the other Indians: They form a peculiar and diſtinct race. But it ſometimes happens, that a huſband and wife, though both of a copper colour, produce one of theſe white children. Wafer, from whom I have tranſcribed theſe facts, tells us, that he has ſeen a child of this kind before it was a year old *.

* Dampier, tom. iv. p. 252.

If this fact be true, the ſingular colour and conſtitution of theſe white Indians would be only a ſpecies of diſeaſe which they derive from their parents. But, if theſe white Indians are not produced by thoſe of a copper colour, but form a diſtinct race, then they reſemble the Chacrelas of Java, and the Bedas of Ceylon, which I formerly deſcribed. If, however, theſe white people actually proceed from copper-coloured parents, we muſt allow that the Chacrelas and Bedas have alſo been produced by tawny progenitors, and that all the white men, whom we find at ſuch great diſtances from each other, form not a particular race, but are only individuals who have accidentally degenerated from their original ſtock.

This laſt opinion, I acknowledge, ſeems to be the moſt probable; and, if voyagers had given us deſcriptions of the Bedas and Chacrelas equally exact with what Wafer has given of the Dariens, we ſhould, perhaps, have been ſatisfied that they are not, any more than the latter, of European extraction. The production of whites by Negro parents, which ſometimes happens, adds great force to this theory. In the hiſtory of the French academy, we have deſcriptions of two of theſe white Negroes. I have ſeen one of them myſelf, and I am aſſured, that they are very frequent among the Negroes of Africa*. What I have ſeen, independent of the relations

* Venus Phyſique.

of

of voyagers, leaves me no room to doubt concerning the origin of theſe white Negroes: They are only Negroes who have degenerated from their race, and not a particular and permanent ſpecies of men: In a word, they are among the Negroes, what Wafer tells us the white Indians are among the yellow or copper-coloured Indians of Darien, and, probably, what the Chacrelas and Bedas are among the brown Indians of the Eaſt. It is ſingular, that this variation of Nature takes place from black to white only, and not from white to black. It is no leſs ſingular, that all the people in the Eaſt Indies, in Africa, and in America, where theſe white men appear, lie under the ſame latitude: The Iſthmus of Darien, the Negroe country, and the iſland of Ceylon, are under the very ſame parallel. White, then, appears to be the primitive colour of Nature, which may be varied by climate, by food, and by manners, to yellow, brown, and black; and which, in certain circumſtances, returns, but ſo greatly altered, that it has no reſemblance to the original whiteneſs, becauſe it has been adulterated by the cauſes which have already been aſſigned.

Upon the whole, the two extremes continually approach each other. Nature, in her moſt perfect exertions, made men white; and the ſame Nature, after ſuffering every poſſible change, ſtill renders them white: But the natural or ſpecific whiteneſs is very different from the individual

dual or accidental. Of this we have examples in vegetables, as well as in men and other animals. A white roſe is very different, even in the quality of whiteneſs, from a red roſe, which has been rendered white by the autumnal froſts.

A ſtill farther proof that thoſe white men are only degenerated individuals, may be drawn from their comparative weakneſs of conſtitution, and from the extreme feebleneſs of their eyes. This laſt fact will appear to be leſs ſingular, when we reflect, that, in Europe, very fair men have generally weak eyes; and I have remarked that their organs of hearing are often dull. Nay, it is even alleged, that dogs of a perfect white colour are deaf: Whether this be generally the caſe, I know not; but I have found it to be true in ſeveral inſtances.

Like the natives of the Iſthmus, the Indians of Peru are of a copper-colour, eſpecially thoſe who dwell in the plains, and along the ſea-coaſt; for thoſe who live in the elevated parts of the country, as between the two chains of the Cordeliers, are nearly as white as the Europeans. Some parts of Peru are a league higher than others, which, with regard to the temperature of the climate, produces a greater change than an hundred leagues of latitude. All the Indians in Guiana and along the river of the Amazones, are more or leſs of a reddiſh tawny colour. The difference of ſhades, ſays M. de la Condamine, is chiefly owing to the temperature of the air, which

which varies from the extreme heat of the Torrid Zone, to the great colds occaſioned by the neighbourhood of the ſnow *. Some of theſe ſavages, as the Omaguas, flatten the viſages of their children, by lacing their heads between two boards †. Others pierce the noſtrils, lips, or cheeks, in order to fix in them the bones of fiſhes, feathers, and other ornaments. Moſt of them pierce their ears, and uſe flowers and herbs in place of ear-rings ‡. Concerning the Amazones, I ſhall be entirely ſilent. The reader may conſult the writers upon this ſubject; and, after peruſing them, he will not diſcover evidence ſufficient to prove the exiſtence of this race of females §.

Some voyagers mention a nation in Guiana, of which the natives are blacker than any other Indians. The Arras, ſays Raleigh, are nearly as black as the Negroes, are extremely ſtrong, and uſe poiſoned arrows. This author ſpeaks likewiſe of another nation of Indians, whoſe necks are ſo ſhort, and ſhoulders ſo elevated, that their eyes ſeem to be upon their ſhoulders, and their mouths in their breaſt. This monſtrous deformity cannot be natural: It is not improbable, that ſavages, who delight in disfiguring Nature by flattening, rounding, or length-

* Voy. de la Condamine, p. 49. † Ibid. p. 72.
‡ Ibid. p. 48. &c. § Ibid. p. 101.; Raleigh; Coreal, tom. ii. p. 25.; La Relation du P. d'Acuna, tom. i. p. 237.; Lettres Edifiantes, recueil x. p. 241.; Voy. de Mocquet, p. 101, &c.

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ening the heads of their children, ſhould likewiſe conceive the fancy of ſinking their heads between their ſhoulders. To give riſe to ſuch abſurd caprices, nothing farther was neceſſary than the idea that deformity rendered them more terrible to their enemies. The Scythians, who were formerly as ſavage as the preſent American Indians, entertained the ſame notions, and practiſed the ſame ridiculous arts, which unqueſtionably gave riſe to what the ancients have written concerning men without heads, men with dogs heads, &c.

The ſavages of Braſil are nearly of the ſame ſize with the Europeans; but they are ſtronger, more robuſt, and more nimble: Neither are they ſubject to ſo many diſeaſes; and they live very long. Their hair, which is black, rarely grows hoary with age. Their colour is tawny, being a mixture of brown and red. They have large heads, broad ſhoulders, and long hair. They pull the hairs out of their beards, their eye-brows, and every other part of their bodies, which gives them an uncommon and fierce aſpect. They pierce their under lip for the purpoſe of inſerting a ſmall bone poliſhed like ivory, or a green ſtone. The mothers flatten the noſes of their children immediately after birth. They all go abſolutely naked, and paint their bodies with various colours*. Thoſe of them who lie

* See Voy. de Lery, p. 108.; Coreal, tom. i. p. 163.; Mem,

lie on the fea-coafts are now a little civilized by the trade they carry on with the Portuguefe; but moft of thofe who inhabit the interior parts of the country are ftill abfolute favages. It is not by force and by flavery that favages are civilized: The miffionaries have polifhed more men in thefe favage nations, than the arms of thofe princes who fubdued them. It was in this manner that Paraguay was conquered. The natural ferocity and ftubbornnefs of thefe favages were overcome by the gentlenefs, humanity, and venerable example of the miffionaries. They often fpontaneoufly folicited to be inftructed in that law which rendered men fo perfect; and they frequently fubmitted to its precepts, and united with fociety. Nothing can reflect greater honour on religion, than the civilizing of thefe nations of barbarians, and laying the foundations of an empire, without employing any other arms but thofe of virtue and humanity.

The inhabitants of Paraguay are, in general, pretty tall, and well fhaped: Their vifage is long, and their fkin of an olive colour *. They are fometimes affected with an extraordinary difeafe: It is a fpecies of leprofy, which forms a cruft over the whole body, refembling the

Mem. pour fervir a l'hift. des Indes, p. 287.; l'hift. des Indes par Maffée, p. 71.; Pyrard, tom. ii. p. 337.; Lettres Edifiantes, recueil xv. p. 331, &c.

* Coreal, tom. i. p. 240. et 259.; Lettres edifiantes, recueil xi. p. 391.; Recueil xii. p. 6.

fcales

ſcales of ſiſhes; but it neither occaſions pain, nor does any injury to their conſtitution *.

Like the Peruvians, the Indians of Chili, according to Frezier, are of a tawny colour, reſembling reddiſh copper. This colour is different from that of the Mulattoes, who, as they are produced by a white man and a Negro woman, or a white woman and a Negro man, are of a brown colour, or a mixture of black and white. The Indians of South America, on the contrary, are yellow, or rather reddiſh. The natives of Chili are of a good ſize; they have thick limbs, a large cheſt, a diſagreeable viſage, ſmall eyes, long ears, and ſtraight, buſhy, black hair. They lengthen their ears, and pull out their beard with pinchers made of ſhells. Though they ſlight the cold, moſt of them go naked, except a ſkin thrown over their ſhoulders. At the extremity of Chili, and on the confines of Terra Magallenica, a gigantic race of men have, it is alleged, been lately diſcovered. Frezier informs us, on the authority of ſeveral Spaniards, who pretended to be eye-witneſſes, that theſe men are nine or ten feet high. Theſe giants, he remarks, are called *Patagonians*, and inhabit the eaſtern part of the deſert coaſt mentioned in ancient voyages: The ſtory of the Patagonians was afterwards regarded as perfectly fabulous; becauſe the Indians diſcovered along the Straits

* Lettres Edifiantes, recueil xxv. p. 122.

of

of Magellan furpaffed not the ordinary ftature of men. It is this circumftance, he continues, that might deceive Froger in his account of the voyage of M. de Gennes; for both fpecies of men have been feen at the fame time by the crew of one veffel. In 1709, the crew of the James of St. Malo faw feven of thefe giants in Gregory Bay, and thofe of the St. Peter of Marfeilles faw fix, whom they accofted, and offered them bread, wine, and brandy, which they refufed, though they had prefented the failors with fome arrows, and affifted them in bringing the fhip's boat afhore*. But, as M. Frezier does not allege that he himfelf faw any of thefe favages, and as the relations which mention them are full of exaggerations with regard to other fubjects, the exiftence of a race of giants, efpecially fo high as ten feet, muft be ftill held as problematical: The body of fuch a man muft be eight times the bulk of that of an ordinary perfon. The mean height of the human fpecies is about five feet: and the extremes exceed not one foot above or below this ftandard. A man of fix feet is very tall, and a man of four is very little. Giants and dwarfs who exceed thefe terms ought to be confidered as accidental varieties, and not as diftinct and permanent races.

Farther, if thofe Magellanic giants exift, their number muft be very fmall; for the favages of the Straits and of the adjacent iflands are of a

* Voy. de M. Frezier, p. 75.

middle

middle ſtature. Their colour is olive; they have a large cheſt; ſquat bodies, thick limbs, and black ſtraight hair *. In a word, their ſtature exceeds not the common ſtandard, and, both in colour and hair, they reſemble the other Americans.

Thus, the whole continent of America contains but one race of men, who are all more or leſs tawny: And, if we except the northern regions, where we find men ſimilar to the Laplanders, and likewiſe men with fair hair, like the inhabitants of the north of Europe, all the reſt of this vaſt territory is peopled with inhabitants, among whom there is little or no diverſity. In the Antient Continent, on the other hand, we have found a prodigious variety in different nations. This great uniformity among the natives of America ſeems to proceed from their living all in the ſame manner. All the Americans were, or ſtill are ſavages: The Mexicans and Peruvians were ſo recently poliſhed, that they ought not to be regarded as an exception. Whatever, therefore, was the origin of theſe ſavages, it ſeems to have been common to the whole. All the Americans have ſprung from the ſame ſource, and have preſerved with little variation, the characters of their race; for they have all continued in a ſavage ſtate, and have

* See Coreal, p. 231. and 284.; l'hiſt. de la Conquête des Molucques, par Argenſola, tom. i. p. 35. and 255.; le Voy. de M. de Gennes, par Froger, p. 97.; les Voy. de la Comp. d'Holl. tom. i. p. 651.; and Dampier, p. 179, &c.

followed

followed nearly the ſame mode of life. Their climates are not ſo unequal, with regard to heat and cold, as thoſe of the Antient Continent, and their eſtabliſhment in this country has been too recent to allow thoſe cauſes which produce varieties ſufficient time to operate, in ſuch a manner as to render their effects conſpicuous.

Each of theſe reaſons merits a ſeparate diſcuſſion. That the Americans are a new people, can admit of no doubt, when we conſider the ſmallneſs of their number, their ignorance, and the little progreſs made by the moſt civilized of them in the arts of life: For, though the firſt relations of the diſcovery and conqueſt of America mention Mexico, Peru, St. Domingo, &c. as countries full of people, and though we are told, that the Spaniards had every where to conquer numerous armies; yet it is eaſy to perceive that theſe facts are exaggerated; becauſe, in the firſt place, few monuments remain of the pretended grandeur of theſe people; 2dly, Becauſe their country, though now peopled with Europeans, who are unqueſtionably more induſtrious than the natives, is ſtill wild, uncultivated, and covered with wood; and beſides, it is only a group of inacceſſible and uninhabitable mountains, which, of courſe leaves only ſmall ſpots proper either for culture or habitation; 3dly, Becauſe even according to their own traditions, concerning the time when they firſt united into ſociety, the Peruvians reckon only 12

kings,

kings, the firſt of whom began to civilize them*; and thus it appears, that not above 300 years had elapſed ſince the Peruvians ceaſed to be abſolutely ſavage; 4thly, Becauſe, if theſe people had been numerous, the Europeans, even with the advantage of gun-powder, would never have been able to enſlave them. The Negroes, notwithſtanding all our attempts to conquer and reduce them to ſubjection, ſtill preſerve their independence, though the effects of gun-powder were equally unknown and equally formidable to them as to the Americans. The facility, therefore, with which America was conquered, appears to be a demonſtration that this country was thinly and recently inhabited.

In the New Continent, the temperature of the different climates is more equal than in the Ancient Continent. This effect is the production of ſeveral cauſes. The Torrid Zone is not ſo hot in America as in Africa. The territories of America comprehended under this Zone are Mexico, New Spain, Peru, the country of the Amazones, Brazil, and Guiana. The heat is never exceſſive in Mexico, in New Spain, or in Peru; becauſe theſe countries are greatly elevated above the ordinary ſurface of the globe. The thermometer, during the hotteſt weather, never riſes ſo high in Peru as in France. The air is cooled by the ſnows which cover the tops of the mountains; and this cauſe, which is a

* Hiſt. des Incas, par Garcilaſſo, &c.

consequence of the former, has great influence on the temperature of the climate. The natives also, instead of being black or very brown, are only tawny. The country of the Amazones is covered with lakes, marshes, rivers, and forests. There the air is extremely moist, and, of course, much cooler than if the land were dry. It is, besides, worthy of remark, that the east wind which blows constantly between the Tropics, arrives not at Brasil, the Amazone country, or Guiana, till it has traversed a vast ocean, and acquired a considerable degree of cold. It is for this reason, as well as the quantity of water, forests, and almost perpetual rains, that these regions of America are much more temperate than they would otherwise be. But the east wind, in traversing the low lands of America, acquires a considerable degree of heat before it arrives at Peru. The air in Peru, therefore, would be much hotter than in Brasil or Guiana, if it were not cooled by the elevation of the country and by snows. The east wind, however, still retains so much heat as to have an influence on the colour of the natives; for those who, by their situation, are much exposed to the east wind, are more yellow than those who live in the valleys between the mountains, and are protected from its effects. Besides, this wind, after striking against the high mountains, is reflected upon the adjacent plains, and carries along with it that

freshness

freſhneſs which it acquires from the ſnow that covers their ſummits; and the melting of the ſnow muſt, of itſelf, frequently produce cool winds. The united operation of theſe cauſes renders the Torrid Zone of America uncommonly temperate. It is not, therefore, ſurpriſing, that we find not, in this country, black, or even brown men, ſimilar to the natives of Africa or Aſia, who live under the ſame parallels, where the circumſtances to be afterwards mentioned are extremely different. Whether we ſuppoſe, therefore, the inhabitants of America to have been anciently or recently eſtabliſhed in that country, we ought not to find black men there; becauſe their Torrid Zone is a temperate climate.

The laſt reaſon I mentioned to account for the little variety among the Americans, was the uniformity in their mode of living. They were all ſavage or very recently civilized, and they all lived in the ſame manner. Suppoſing them to have been derived from a common origin, they were diſperſed, without having their breed croſſed. Each family gave riſe to a nation, the inhabitants of which were not only ſimilar to each other, but to all the neighbouring tribes. As both their food and their climates were nearly the ſame, they had no means either of improving or degenerating. They muſt, therefore, have always continued the ſame, whatever climate they chanced to occupy.

With regard to their origin, I have no doubt, independent of theological confiderations, that it is the fame with ours. The refemblance of the North American favages to the oriental Tartars, renders it probable, that they originally fprung from the fame ftock. The late difcoveries by the Ruffians of feveral lands and iflands beyond Kamtfchatka, which extend nearly as far as the weft part of the Continent of America, leave no room to queftion the poffibility of a communication, provided thefe difcoveries were well attefted, and the lands lay contiguous. But, even fuppofing confiderable intervals of fea, is it not extremely probable that fome people had croffed thefe intervals in queft of new countries, or that they were thrown upon the American coafts by tempefts? There is, perhaps, a greater interval of fea between the Marianne iflands and Japan, than between any of the lands from Kamtfchatka to America; and yet the Marianne iflands were peopled with inhabitants who muft have come from the eaftern continent. I am, therefore, inclined to believe that the firft men who arrived at America, landed on the north-weft of California; that the extreme cold of this climate obliged them to migrate to the more fouthern parts of their new habitation; that they firft fettled at Mexico and Peru, from whence they again fpread over the fouthern and northern regions of that continent; for Mexico and Peru muft be confidered as the oldeft and firft inha-

 bited

bited territories of America, becauſe they are the moſt elevated, and the only countries where men were found who had formed regular ſocieties. We may alſo preſume, that the inhabitants of Davis's Straits, and of the northern parts of Labrador, came originally from Greenland, which is ſeparated from America only by this narrow ſtrait; for, as I formerly remarked, the natives of Davis's Straits, and thoſe of Greenland, have a perfect reſemblance to each other. As to the manner in which Greenland was peopled, it is probable that the Laplanders would migrate from Cape-north, which is only 150 leagues from Greenland. Farther, as the iſland of Iceland is almoſt contiguous to Greenland, and is not very remote from the moſt northerly of the Orcades, it is probable that it has long been inhabited and frequented by the people of Europe; and that colonies had even been eſtabliſhed in Greenland by the Danes. That white men, with fair hair, ſhould have been found in Greenland, is not, therefore, ſurpriſing, as they derived their origin immediately from the Danes; and there is reaſon to think, that the white men along Davis's Straits proceeded from the European whites who had been ſettled in Greenland, from which they might eaſily paſs by traverſing the narrow ſea that forms this ſtrait.

America is not leſs ſingular for the uniformity in the figure and colour of its inhabitants, than Africa is remarkable for the variety of men

it contains. This part of the world is very ancient, and very populous. The climate is extremely hot; and yet the temperature of the air differs widely in different nations. Their manners alſo are not leſs various, as appears from the deſcription I have given of them. All theſe cauſes have concurred in producing a greater variety of men in this quarter of the globe than in any other: For, in examining the differences of temperature in the countries of Africa, we find, that, in Barbary, and all the regions adjacent to the Mediterranean, the men are white, and only a little tawny: This whole tract of country is refreſhed, on one hand, by the air of the Mediterranean Sea, and by the ſnows on Mount Atlas, on the other: It is, beſides, ſituated in the Temperate Zone, on this ſide of the Tropic. All the natives, likewiſe, from Egypt to the Canary iſlands, are only more or leſs tawny. Beyond the Tropic, and on the other ſide of Mount Atlas, the heat becomes much greater, and the inhabitants are very brown, but not entirely black. When we come, however, to the 17th or 18th degree of north latitude, under which Senegal and Nubia are ſituated, the heat is exceſſive, and the natives are perfectly black. At Senegal, the liquor in the thermometer riſes to 38 degrees, while it ſeldom riſes to 30 in France, and never exceeds 25 in Peru, though it be ſituated under the Torrid Zone. In Nubia, we have no obſervations made with the thermometer: But all

travellers agree in declaring the heat to be excessive. The sandy deserts between Upper Egypt and Nubia heat the air to such a degree, that the north wind must be extremely scorching in that country. Besides, as the east wind, which generally blows between the Tropics, arrives not at Nubia till it has traversed Arabia, it is not surprising to find the natives very black: It is still less surprising to see the inhabitants of Senegal perfectly black; for the east wind, before it reaches them, must blow over the whole of Africa in its greatest breadth, which renders the heat of the air almost insupportable. Taking, therefore, the whole of Africa situated between the Tropics, where the east wind blows most constantly, we may easily conceive why the western coasts of this part of the globe should and actually do suffer a greater degree of heat than the eastern coasts; for this wind arrives at the eastern coasts with a freshness which it acquires by traversing a vast sea; but, on the other hand, before it arrives at the western coasts, it acquires a scorching heat by blowing across the interior regions of Africa. It is for this reason that the coasts of Senegal, Sierra-Leona, Guiney, and all the western parts of Africa situated under the Tropics, are the hottest climates on the globe. It is not near so hot on the eastern coasts, as at Mosambique, Mombaza, &c. I cannot, therefore, hesitate in ascribing to this reason the cause of our finding the true Negroes, or the blackest men,

men, on the weſtern territories of Africa, and Caffres, or men of a leſs deep blackneſs, on the eaſtern coaſts. The difference between theſe two kinds of blacks, which is very apparent, proceeds from the heat of the climate, which is not very hot in the eaſtern parts, but exceſſive on the weſtern. Beyond the Tropic on the ſouth, the heat conſiderably diminiſhes, both on account of the higher latitude, and becauſe the point of Africa begins to turn narrow; and this point of land, being ſurrounded by the ſea, receives freſher breezes than if it had been in the midſt of a continent. The natives alſo of this country begin to whiten, and are naturally more white than black, as was formerly remarked. Nothing can prove more clearly that the climate is the principal cauſe of the varieties of mankind, than this colour of the Hottentots, whoſe blackneſs could not be diminiſhed but by the temperature of the climate.

We will be the more confirmed in this opinion, if we examine the other people who live under the Tropics to the eaſt of Africa. The inhabitants of the Maldiva iſlands, of Ceylon, of the point of the Indian Peninſula, of Sumatra, of Malacca, of Borneo, of Celebes, of the Philippine iſlands, &c. are all very brown, without being abſolutely black; becauſe all theſe territories are either iſlands or peninſula's. The ſea, in theſe climates, has a great effect in tempering the air; and beſides, the eaſt and weſt winds,

 which

which blow alternately in this part of the globe, paſs over a vaſt extent of ſea, before they arrive at this Archipelago. Thus all theſe iſlands are peopled with brown men, becauſe the heat is not exceſſive. But, in New Guiney, we find blacks, who, from the deſcriptions of voyagers, appear to be real Negroes; becauſe, in this country, which extends ſo far to the eaſt as to form a kind of continent, the wind which traverſes it is much hotter than that which prevails in the Indian ocean. In New Holland, which is not ſo hot a climate, the natives are leſs black, and very ſimilar to the Hottentots. Do not theſe Negroes and Hottentots, who live ſo remote from the other people diſtinguiſhed by that appellation, prove that their colour depends on the heat of the climate? No communication can ever be ſuppoſed to have taken place between Africa and this ſouthern continent; and yet we find there the ſame ſpecies of men, becauſe the ſame circumſtances concur in producing the ſame degree of heat. An example taken from the other animals will ſtill farther confirm what has been advanced. It has been remarked, that, in the province of Dauphiny, all the ſwine are black, but that, in Vivarais, on the other ſide of the Rhone, where it is colder than in Dauphiny, all theſe animals are white. It is not probable that the inhabitants of one of theſe two provinces would agree to raiſe only black ſwine, and the other only white ſwine. It appears to me, that this

phæno-

phænomenon is owing to the different tempera- ture of the climates, combined, perhaps, with the manner of feeding these animals.

The few blacks who are found in the Philippines, and some other islands of the Indian ocean, are probably derived from the Papous or Negroes of New Guiney, with which the Europeans have been acquainted for these last 50 years only. Dampier, in the 1700, discovered the most eastern part of this country, to which he gave the name of New Britain; but its extent is still unknown; we only know that those parts of it which have been discovered seem to be thinly inhabited.

Thus it appears, that the existence of Negroes is confined to those parts of the earth, where all the necessary circumstances concur in producing a constant and an excessive heat. This heat is so necessary, not only to the production, but even to the preservation of Negroes, that it has been remarked in our islands, where the heat, though great, is not comparable to that of Senegal, that the Negroe infants are so liable to be affected by impressions from the air, that the proprietors are obliged to keep them, for the first nine days after birth, in close warm chambers. If these precautions be neglected, and the children exposed to the air immediately after birth, they are liable to be affected with a tetanus, or locked jaw, which proves fatal, because it deprives them of the power of taking nourishment.

 M. Littre,

M. Littre, who diſſected a Negro in the year 1702, remarked, that the end of the glans, which was not covered with the prepuce, was black, and that the part of it which was covered was perfectly white *. This obſervation demonſtrates, that the air is neceſſary to produce the blackneſs of Negroes. Their children are born white, or rather red, like thoſe of other men. But, two or three days after birth, their colour changes to a yellowiſh tawny, which grows gradually darker till the 7th or 8th day, when they are totally black. It is well known, that all children, two or three days after birth, are affected with a kind of jaundice, which among white people ſoon paſſes off and leaves no impreſſion: But in Negroes, on the contrary, it gives an indelible colour to the ſkin, which becomes always more and more black. M. Kolbe remarks, that he has ſeen Hottentot children, who were born as white as the Europeans, become olive in conſequence of this jaundice, which ſpreads over the ſkin three or four days after birth, and never goes off. This jaundice, and the impreſſion of the air, however, are only the occaſional, and not the primary cauſes of blackneſs; for it has been obſerved, that the children of Negroes, as ſoon as they come into the world, have black genitals, and a black ſpot at the root of their nails. The action of the air, and the jaundice, may, perhaps, help to expand this colour; but it is certain, that the rudiments of

* Hiſt de l'Acad. des Sciences, année 1702, p. 32.

blackneſs

blackneſs are communicated to them by their parents; that, in whatever part of the world a Negroe is brought forth, he will be equally black as if he had been born in his own country; and that, if there is any difference in the firſt generation, it is ſo ſmall as not to be perceptible. This fact, however, implies not that the colour will continue the ſame after many ſucceſſive generations. On the contrary, there are many reaſons for preſuming, that, as this colour is originally the effect of a long continued heat, it will be gradually effaced by the temperature of a cold climate; and conſequently, that, if a colony of Negroes were tranſplanted into a northern province, their deſcendants of the 8th, 10th, or 12th generation, would be much fairer, and perhaps as white as the natives of that climate.

Anatomiſts have inquired into the ſeat of this black colour. Some of them alledge, that it neither reſides in the ſkin nor ſcarf-ſkin, but in the cellular membrane between them *; that this membrane, after long maceration in hot water, retains its origin blackneſs; but that the ſkin and ſcarf-ſkin appear to be as white as thoſe of other men. Dr. Town, and ſome others, have maintained, that the blood of the Negroes is black, and that their blackneſs originates entirely from their blood †. I am much inclined to

* Hiſt. de l'Acad. des Sciences, année 1702, p. 32.

† See Dr. Town's letter to the Royal Society.

believe this fact; for I have obſerved, that, among us, the blood of thoſe perſons who have tawny, yellowiſh, or brown complexions, is blacker than that of thoſe who are fairer. M. Barrere, who ſeems to have examined this ſubject moſt minutely *, tells us, and M. Winſlow agrees with him †, that the ſcarf-ſkin of Negroes is black; and, though its extreme thinneſs and tranſparency may make it appear white, that it is really as black as the blackeſt horn, when reduced to the ſame degree of thinneſs. They alſo aſſure us, that the ſkin of Negroes is of a reddiſh brown colour, approaching to black. This colour of the Negroes, according to Barrere, is produced by their bile, which he affirms, from ſeveral diſſections he made in Cayenne, inſtead of yellow, to be as black as ink. The bile, when abſorbed and diſperſed through the body, tinges the ſkin of white people yellow; and, if it were black, it would probably produce a black colour. But, as ſoon as the effuſion of the bile ceaſes, the ſkin reſumes its natural whiteneſs. We muſt, therefore, ſuppoſe that the bile of the Negroes is perpetually effuſed, or, as Barrere alledges, that it is ſo abundant as to be naturally ſecreted in the ſcarf-ſkin, and to tinge it of a black colour. Upon the whole, it is probable, that both the bile and blood of Negroes are browner than thoſe of white people, as

* Diſſert. ſur la Couleur des Negres, par. M. Barrere.

† Expoſ. Anatom. du Corps Humain, par M. Winſlow, p. 489.

their

their ſkin is likewiſe blacker. But one of theſe facts cannot be admitted to prove the cauſe of the other; for, if the blackneſs of the blood or bile be allowed to give the ſame colour to the ſkin, then, inſtead of demanding why the ſkin of Negroes is black, we ought to aſk why their blood or their bile are of that colour? This ſpecies of falſe reaſoning, in place of ſolving the queſtion, renders it ſtill more intricate. To me it has always appeared, that the ſame cauſe which makes our complexions brown, after being expoſed to the action of the air, and to the rays of the ſun, which renders the Spaniards more brown than the French, and the Moors than the Spaniards, alſo renders the Negroes blacker than the Moors. Beſides, I am not here inquiring how this cauſe acts; I only mean to aſcertain that it does act, and that its effects are more perceptible in proportion to its ſtrength and time of acting.

The heat of the climate is the chief cauſe of blackneſs among the human ſpecies. When this heat is exceſſive, as in Senegal and Guiney, the men are perfectly black; when it is a little leſs violent, the blackneſs is not ſo deep; when it becomes ſomewhat temperate, as in Barbary, Mogul, Arabia, &c. the men are only brown; and, laſtly, when it is altogether temperate, as in Europe and Aſia, the men are white. Some varieties, indeed, are produced by the mode of living. All the Tartars, for example, are tawny,

ny, while the Europeans, who live under the ſame latitude, are white. This difference may ſafely be aſcribed to the Tartars being always expoſed to the air; to their having no cities or fixed habitations; to their ſleeping conſtantly on the ground; and to their rough and ſavage manner of living. Theſe circumſtances are ſufficient to render the Tartars more ſwarthy than the Europeans, who want nothing to make life eaſy and comfortable. Why are the Chineſe fairer than the Tartars, though they reſemble them in every feature? Becauſe they are more poliſhed; becauſe they live in towns, and practiſe every art to guard themſelves againſt the injuries of the weather; while the Tartars are perpetually expoſed to the action of the ſun and air.

But, when the cold becomes extreme, it produces effects ſimilar to thoſe of violent heat. The Samoiedes, the Laplanders, and the natives of Greenland, are very tawny. We are even aſſured, that ſome of the Greenlanders are as black as the Africans. Here the two extremes approach each other: Great cold and great heat produce the ſame effect upon the ſkin, becauſe each of theſe cauſes acts by a quality common to both; and this quality is the dryneſs of the air, which, perhaps, is equally great in extreme cold as in extreme heat. Both cold and heat dry the ſkin, and give it that tawny hue which we find among the Laplanders. Cold contracts all the productions of nature. The Laplanders, accordingly, who

are

are perpetually expoſed to the rigours of froſt, are the ſmalleſt of the human ſpecies. Nothing can afford a ſtronger example of the influence of climate than this race of Laplanders, who are ſituated, along the whole polar circle, in an extenſive zone, the breadth of which is limited by nothing but exceſſive cold; for that race totally diſappears, whenever the climate becomes a little temperate.

The moſt temperate climate lies between the 40th and 50th degree of latitude, and it produces the moſt handſome and beautiful men. It is from this climate that the ideas of the genuine colour of mankind, and of the various degrees of beauty, ought to be derived. The two extremes are equally remote from truth and from beauty. The civilized countries, ſituated under this zone, are Georgia, Circaſſia, the Ukraine, Turkey in Europe, Hungary, the ſouth of Germany, Italy, Switzerland, France, and the northern part of Spain. The natives of theſe territories are the moſt handſome and moſt beautiful people in the world.

The climate may be regarded as the chief cauſe of the different colours of men. But food, though it has leſs influence upon colour, greatly affects the form of our bodies. Coarſe unwholeſome, and ill prepared food, makes the human ſpecies degenerate. All thoſe people who live miſerably, are ugly and ill-made. Even in France, the country-people are not ſo beautiful

as thoſe who live in towns; and I have often remarked, that in thoſe villages where the people are richer and better fed than in others, the men are likewiſe more handſome and have better countenances. The air and the ſoil have great influence upon the figure of men, beaſts, and plants. In the ſame province, the inhabitants of the elevated and hilly parts are more active, nimble, handſome, ingenious, and beautiful, than thoſe who live in the plains, where the air is thick and leſs pure. In France, it is impoſſible to perpetuate the race of Spaniſh or Barbary horſes: They degenerate even in the firſt generation, and, in the third or fourth, unleſs the breed be croſſed by the importation of freſh ſtallions, they become altogether French horſes. The effects of climate and of food upon animals are ſo well known, that we need hardly mention them: And, though their operation is ſlower and leſs apparent upon men; yet, from analogy, we ought to conclude, that their effects are not leſs certain, and that they manifeſt themſelves in all the varieties we find among the human ſpecies.

Upon the whole, every circumſtance concurs in proving, that mankind are not compoſed of ſpecies eſſentially different from each other; that on the contrary, there was originally but one ſpecies, who, after multiplying and ſpreading over the whole ſurface of the earth, have undergone various changes by the influence of climate, food, mode of living, epidemic diſeaſes, and the

mixture

mixture of diſſimilar individuals; that, at firſt, theſe changes were not ſo conſpicuous, and produced only individual varieties; that theſe varieties became afterwards ſpecific, becauſe they were rendered more general, more ſtrongly marked, and more permanent, by the continual action of the ſame cauſes; that they are tranſmitted from generation to generation, as deformities or diſeaſes paſs from parents to children; and that, laſtly, as they were originally produced by a train of external and accidental cauſes, and have only been perpetuated by time and the conſtant operation of theſe cauſes, it is probable that they will gradually diſappear, or, at leaſt, that they will differ from what they are at preſent, if the cauſes which produced them ſhould ceaſe, or if their operation ſhould be varied by other circumſtances and combinations.

A

DISSERTATION

ON THE

NATURE of ANIMALS.

ALL our knowledge is derived from comparing the relations and differences which ſubſiſt between objects. If brute animals had no exiſtence, the nature of man would be ſtill more incomprehenſible. Having formerly conſidered man as a detached being, let us now inſtitute a compariſon between him and the other animals. Let us examine the nature of the animal world; let us inveſtigate their organization, and ſtudy their general œconomy. This inquiry will enable us to draw particular inferences,

ferences, to discover relations, to reconcile apparent differences, and, from a combination of facts, to distinguish the principal effects of the living machine, and lead us to that important science of which man is the ultimate object.

I shall begin with explaining the subject, and by reducing it to its just limits.

The general properties of matter, being common to animated as well as inanimated beings, belong not to our subject *. The qualities possessed in common by plants and animals, ought likewise to be rejected. It is for this reason that we have treated of nutrition, of growth, of reproduction, and even of generation, properties common to the plant and animal, before entering upon those qualities which are peculiar to animated bodies.

In the next place, as many beings are comprehended in the class of animals, whose organization differs greatly from that of man and the more perfect animals, we shall likewise keep these out of our view, and examine such only as make the nearest approaches to ourselves.

But, as man is not a simple animal, and as his nature is superior to that of other animals, we shall endeavour to investigate the cause of this superiority, that we may be enabled to distinguish what is peculiar to him, from what he possesses in common with other animated beings.

* See above, Vol. II. Chap. I.

Having thus circumfcribed our fubject, and lopt off its extremities, we fhall proceed to the general divifion of it. Before giving a detail of the various parts, and of their functions, let us attend to the general refults of the animal machine; and, before reafoning upon the caufes, let us enumerate and defcribe the effects.

An animal is diftinguifhed by two modes of exiftence, that of motion, and that of reft, which alternately fucceed one another during the whole of life. In the former, all the fprings of the machine are in action; in the latter, all is at reft, except one part, and that part acts equally when the animal is afleep and when it is awake. This part, therefore, is abfolutely neceffary, fince the animal, without it, cannot exift. This part is likewife independent of the other, becaufe it can act alone; and the other part depends upon this, becaufe it cannot act without its affiftance. The one is a fundamental part of the animal œconomy, becaufe it acts continually and without interruption; the other is lefs effential, becaufe it acts only by alternate intervals.

This firft divifion of the animal œconomy is general, and feems to be well founded. It is not fo difficult to examine an animal when afleep, as when awake and in action. This diftinction is effential, and not a fimple change of condition, as in an inanimated body, which is equally indifferent to reft or motion; for an inanimated body would continue perpetually in

either of these states, unless it were constrained to change, by the application of some impelling or resisting force. But an animal changes its state by its own proper powers. It passes naturally, and without restraint, from motion to rest, and from rest to motion. The moment of awaking returns as necessarily as that of sleep, and both happen independent of foreign causes; because the animal can exist during a certain time only in either state; and continued waking or sleeping would be equally fatal to life.

The animal œconomy, then, may be divided into two parts; the first of which acts perpetually without any interruption, and the second acts by intervals only. The action of the heart and lungs, in animals which respire, and the action of the heart in the fœtus state, constitute the former; and the action of the senses, joined to the movements of the members, constitute the latter.

If we conceive the existence of beings endowed by Nature with this first part of the animal œconomy only, though deprived of sense and progressive motion, they would still be animated, and would differ in nothing from animals asleep. An oyster, or a zoophyte, which appear not to possess either external senses, or the power of progressive motion, are animals destined to sleep continually. A vegetable, in this view, is a sleeping animal: And, in general, every organized being, deprived of sense and motion, may be

be compared to an animal conſtrained by Nature to perpetual ſleep.

Sleep, in the animal, therefore, is not an accidental ſtate induced by the exerciſe of its functions while awake; It is, on the contrary, an eſſential mode of exiſtence, and ſerves as a baſis to the animal œconomy. Our being commences with ſleep; the fœtus ſleeps perpetually; and the infant conſumes moſt of its time in that ſtate.

Sleep, therefore, which appears to be a ſtate purely paſſive, a ſpecies of death, is, on the contrary, the original condition of animated beings, and the very foundation of life itſelf. It is not a privation of certain qualities and exertions, but a real and more general mode of exiſtence than any other. With ſleep our exiſtence commences: All organized beings, which are not endowed with ſenſes, remain perpetually in this condition; none exiſt in continued action; and the exiſtence of every animal conſiſts more or leſs of this ſtate of repoſe.

If the moſt perfect animal were reduced to that part alone which acts perpetually, it would not differ, in appearance, from thoſe beings to which we can hardly aſcribe the name of Animal. With regard to external functions, it would have a ſtriking reſemblance to a vegetable; for, though the animal and vegetable differ in external organization, they both exhibit the ſame reſults: They both receive nouriſhment, grow,

grow, expand, and are endowed with internal movements and a vegetating life. On this supposition, they would be equally deprived of progressive motion, action, and sentiment; and they would have no external or apparent character of animation. But, if this internal part be clothed with a proper cover, or, in other words, if it be endowed with senses and members, animal life will instantly manifest itself; and, in proportion to the quantity of sense and members contained in this cover, the animation will be more complete, and the animal more perfect. It is this envelope, or cover, therefore, which constitutes the distinction between different animals. The internal part, which is the basis of the animal œconomy, is common to every animated being, without exception; and, as to its mode, it is nearly the same in man and in all animals which consist of flesh and blood. But the external cover is exceedingly diversified, and the greatest differences originate from the extremities of this cover.

To illustrate this subject, let us compare the body of a man with that of a horse, an ox, &c. The internal part, which acts perpetually, namely, the heart and lungs, or the organs of circulation and respiration, is nearly the same in man and in the animal. But the external cover is extremely different. The solids of the animal's body, though composed of parts similar to those of the human frame, differ prodigiously in number,

number, magnitude, and position. The bones are more or less shortened, rounded, lengthened, flattened, &c. Their extremities are more or less elevated, or hollowed; and several of them are sometimes united into one. Some, as the clavicles, are entirely wanting; the number of others is augmented, as the cartilages of the nose, the vertebræ, the ribs, &c. Of others, the number is diminished, as the bones of the carpus, metacarpus, tarsus, metatarsus, phalanges, &c. which give rise to great varieties in the figure of animals, compared with that of the human body.

We will be still farther convinced, that the principal distinctions between the body of man, and those of the other animals, arise from the extremities, if we attend to the following circumstances. Let us divide the body into three principal parts, the trunk, the head, and the members. The head and members, which are the extremities of the body, constitute the chief differences between man and the other animals. By examining these three principal parts, we find that the greatest differences in the trunk are found at its superior and inferior extremities; for the animals have no clavicles on the superior extremity of the trunk, and the inferior is terminated by a tail, which consists of a certain number of external vertebræ, that exist not in man. In the same manner, the inferior extremity of the head, or jaw-bones, and the superior,

or frontal bone, differ widely in man and the quadrupeds. The jaw-bones of moſt animals are greatly lengthened, and their frontal bones, on the contrary, are contracted. In fine, by comparing the members of a brute with thoſe of a man, it is eaſy to perceive that they differ chiefly in their extremities; for, at the firſt glance of the eye, nothing has leſs reſemblance to the human hand than the foot of a horſe or an ox.

Regarding the heart, therefore, as the centre of the animal machine, it is obvious that man reſembles the other animals in this and the neighbouring parts; and that the farther from this centre, the differences become more conſiderable, till we arrive at the extremities, where they are by much the greateſt. But, where this centre, or the heart itſelf, differs, then the animal is infinitely removed from man, and poſſeſſes nothing in common with the creatures under conſideration. In moſt inſects, for example, the organization of this principal part of the animal œconomy is ſingular. Inſtead of a heart and lungs, we find parts which perform ſimilar functions, and for that reaſon have been regarded as analogous to thoſe viſcera, but which, in reality, are very different, both in their ſtructure, and in the reſult of their action. Inſects, accordingly, differ as much as poſſible from man and the quadrupeds. A ſlight variation in the central parts is always accompanied with an amazing differ-

ence in the external configuration. The heart of a turtle is of a ſingular ſtructure; and its figure is ſo extraordinary, that it has no reſemblance to any other creature.

In contemplating men, quadrupeds, birds, fiſhes, and reptiles, what a prodigious variety occurs in the figure and proportion of their bodies, in the number and poſition of their members, in the ſubſtance of their fleſh, bones, and integuments? The quadrupeds have tails and horns; and all their extremities differ remarkably from thoſe of man. The cetaceous animals live in a different element; and though they generate in a manner ſimilar to the quadrupeds, their figure is extremely different, being totally deprived of inferior extremities. The birds differ ſtill more from man, by their beak, their feathers, their flying, and their multiplication by means of eggs. The fiſhes and amphibious animals are ſtill farther removed from the human figure; and the reptiles are entirely deſtitute of members. Thus we find, that the greateſt diverſity conſiſts in the envelope, or external cover, the internal ſtructure, on the contrary, being nearly the ſame: All animals are furniſhed with a heart, a liver, a ſtomach, inteſtines, and organs of generation. Theſe, therefore, ought to be regarded as the moſt eſſential parts of the animal œconomy, becauſe they are the moſt conſtant, and leaſt ſubject to variation.

But

But it is worthy of remark, that, even in this cover, ſome parts are more conſtant than others. None of theſe animals are deprived of all the ſenſes. In treating of the ſenſes, we explained what might be their ſpecies of feeling. We know not the nature of their ſmelling and taſte; but we are certain, that they are all endowed with the ſenſe of ſeeing, and perhaps alſo with that of hearing. The ſenſes, therefore, may be conſidered as another eſſential part of the animal œconomy, as well as the brain, which is the origin of all ſenſation. Even the inſects which differ ſo much in their central parts from other animals, have ſomething analogous to a brain, and its functions are ſimilar to thoſe of the other animals: And thoſe animals, as the oyſter, which ſeem to be deprived of a brain, ought to be regarded as beings only half animated, and as forming the ſhade between animal and vegetable life.

Thus we have diſcovered the brain and the ſenſes to be a ſecond eſſential part of the animal œconomy. The brain is the centre of the envelope or cover, as the heart is the centre of the internal part of the animal. It is from the brain that the external parts receive their power of moving and acting, by means of the ſpinal marrow and the nerves, which are only prolongations of this marrow: And, as the heart and the whole interior parts communicate with the brain and external cover, by means of the diſtribution of

blood-

blood-veſſels, the brain has a ſimilar communication with the internal parts by the ramifications of the nerves. This union is intimate and reciprocal; and, though the functions of the two organs be totally different, they cannot be ſeparated, without inſtant deſtruction to the animal.

The heart, and the whole internal parts, act continually, without the ſmalleſt interruption, and independent of external cauſes. But the ſenſes and envelope act only by alternate intervals, and ſucceſſive vibrations excited by external cauſes. Objects act upon the ſenſes, and this action is modified by the ſenſes, and tranſported, in this modified form, to the brain, where the impreſſion firſt receives the appellation of Senſation: The brain, in conſequence of this impreſſion, acts upon the nerves, and communicates the vibrations it receives; and theſe vibrations produce progreſſive motion, and all the other external actions of the body. When a body is acted upon by any cauſe, it is well known, that the body re-acts upon the cauſe. Thus objects act upon animals by means of the ſenſes; and animals re-act upon objects by their external movements; and, in general, action is the cauſe, and re-action the effect.

The effect, it may be ſaid, is not, in this caſe, proportioned to the cauſe: In ſolid bodies, which follow the laws of mechaniſm, action and re-action are always equal. But, in the animal body,

body, re-action, or external motion, seems to be incomparably greater than action; and, consequently, progressive motion, and the other external movements, ought not to be regarded as simple effects of the impressions of objects upon the senses. To this objection I reply, that, though effects, in certain circumstances, appear to be proportioned to their causes; yet there are in Nature innumerable instances where the effects have no proportion to their apparent causes. A single spark of fire will inflame a magazine of powder, and blow up a citadel. A slight friction produces, by electricity, a concussion so violent, that it is communicated to great distances, and affects equally a thousand persons at the same time. It is not, therefore, surprising that a slight impression on the senses should produce a violent re-action in the animal body, manifesting itself by external movements.

Causes which admit of measurement, and the quantity of whose effects can be exactly estimated, are not so numerous as those whose qualities and manner of acting are perfectly unknown; and, consequently, the proportion they may have to their effects must be equally unknown. To measure a cause, it must be simple; its action must be constant, and uniformly the same, or, at least, it must vary according to a known law only. Now, most effects in nature are produced by a combination of different causes, the action of which varies, and which observe no constant law;

law; and, of courſe, they can neither be meaſured nor eſtimated, but by endeavouring to approach the truth by probable conjectures.

I pretend not, therefore, to lay it down as a demonſtrated fact, that progreſſive motion, and the other external movements of animals, have no other cauſe but that of the impreſſions of objects upon the ſenſes. I only ſay, that the fact is probable, and ſeems to be founded on ſtrong analogies: For, I find, that all organized beings, which are deprived of ſenſes, are likewiſe deprived of the power of progreſſive motion, and that all thoſe which are endowed with ſenſes, enjoy likewiſe the loco-motive faculty. I alſo find, that this action of objects upon the ſenſes often makes the animal move inſtantaneouſly, and even involuntarily; and that, when the movement is determined by the will, it is always the effect either of the immediate action of objects upon the ſenſes, or of the remembrance of a former impreſſion.

To render this matter more clear, let us analyſe the phyſical laws of our own actions. When an object ſtrikes any of our ſenſes, and produces an agreeable ſenſation, and, of courſe, a deſire, this deſire muſt have a relation to ſome quality or mode of our enjoyment. We cannot deſire an object in any other way than to have an inclination to ſee, hear, taſte, ſmell, or touch it; and this deſire is only to gratify more fully either that ſenſe with which we perceive the object,

ject, or ſome of our other ſenſes at the ſame time; or, in other words, to heighten the agreeableneſs of the firſt ſenſation, or to excite another, which is a new mode of enjoying an object: For, the moment we perceive our object, if we could fully enjoy it by all the ſenſes at once, we would have nothing to deſire. Deſire, then, originates from our being ill ſituated with regard to the object perceived. We are either too near it or too diſtant. We, therefore, naturally change our ſituation; becauſe, at the ſame time that we perceive the object, we alſo perceive the obſtruction to the full enjoyment of it, ariſing from the diſtance or proximity of our ſituation. Hence the movements we perform in conſequence of deſire, and the deſire itſelf, proceed entirely from the impreſſion made by the object upon our ſenſes.

When we perceive an object with the eye, and have an inclination to touch it, if it be near, we ſeize it with our hand, and, if at a diſtance, we move forward, in order to approach it. A man, when deeply occupied with ſtudy, if he be hungry, will lay hold of bread which he feels under his hand, and even carry it to his mouth and eat it, without being conſcious of his having acted in this manner. Theſe motions neceſſarily reſult from the firſt impreſſion made by the object; and they would never fail to ſucceed the impreſſion, if this natural effect were not oppoſed by other impreſſions, which, by acting at the

ſame

fame time, often weaken and efface the action of the first.

An organized being, therefore, without fenfation, as an oyfter, which probably enjoys the fenfe of feeling very imperfectly, is deprived not only of progreffive motion, but of fentiment and intelligence; becaufe each of them would equally excite defire, and his defire would manifeft itfelf by external movements. I am uncertain whether beings deprived of fenfes have any perception of their own exiftence; if they have, it muft be very imperfect, fince they are unable to perceive the exiftence of others.

To illuftrate this fubject ftill farther, let us fuppofe a man, at the moment he wifhes to approach an object, fuddenly deprived of all his members, would he not endeavour to trail his trunk along the ground, in order to gratify his defire? Nay, were he reduced to a globular form, and actuated by the fame defires, though deprived of every faculty of motion, he would ftill exert all his force to obtain a change of fituation: But, on this fuppofition, as he could only act againft the point that fupported him, he would ftill evince his paffion by raifing his body. Thus external and progreffive motion depend not on the organization and figure of the body, fince, whatever be the conformation of any being, if endowed with fenfes and a defire of gratifying them, it would not fail to move.

The facility, the quickneſs, the direction, and the continuation of motion, depend, it is true, upon external organization: But the cauſe, principle, and determination of it, proceed ſolely from deſire, excited by the impreſſion of objects upon the ſenſes; for, if a man were deprived of ſight, he would make no movement to gratify his eyes. The ſame thing would happen if he were deprived of any of the other ſenſes; and, if deprived of every ſenſe, he would remain perpetually at reſt; and no object would excite him to move, though, by his external conformation, he were fully capable of motion.

Natural wants, as that of taking nouriſhment, are internal movements, which neceſſarily excite deſire or appetite. Theſe movements may produce external motion in animals; and, provided they are not entirely deprived of external ſenſes, relative to theſe wants, they will act in order to ſupply them. Want is not deſire: the former differs from the latter as cauſe differs from effect; deſire, therefore, cannot be produced without the intervention of ſenſes. Whenever an animal perceives an object fitted to ſupply its wants, deſire is inſtantly excited, and action or motion ſucceeds.

The action of external objects muſt neceſſarily produce ſome effect; and it is eaſy to perceive that this effect is animal motion; ſince every time the ſenſes are ſtruck in the ſame manner, the ſame movements uniformly ſucceed. But how

how does the action of objects excite desire or aversion? How shall we obtain a clear conception of the operation of that principle to which the senses communicate their notices? The senses are only the middle term between the action of objects and animal action. This principle, however, has the power of determining all our motions; for it can modify and alter the animal action, and even sometimes counteract it, notwithstanding the impression of objects.

With regard to man, whose nature is so different from that of other animals, this question is difficult to solve; because the soul participates all our movements; and it is not easy to distinguish the effects of this spiritual substance from those produced solely by the material part of our frame. Of this we can form no judgment but by analogy, and by comparing our actions to the natural operations of the other animals. But, as this spiritual substance has been conferred on man alone, by which he is enabled to think and reflect, and, as the brutes are purely material, and neither think nor reflect, and yet act, and seem to be determined by motives, we cannot hesitate in pronouncing the principle of motion in them to be perfectly mechanical, and to depend absolutely on their organization.

I apprehend, therefore, that, in the animal, the action of objects on the senses produces another on the brain, which I consider as a general internal sense, that receives all the impressions

ſions tranſmitted to it by the external ſenſes. This internal ſenſe is not only ſuſceptible of vibrations from the action of the ſenſes, but is capable of retaining, for a long time, the vibrations thus excited; and it is the continuation of theſe vibrations that conſtitute impreſſions, which are more or leſs deep, in proportion to the duration of the vibrations.

The internal ſenſe, therefore, differs, in the *firſt* place, from the external ſenſes by the faculty which it poſſeſſes of receiving every ſpecies of impreſſion; while the external ſenſes are only affected in one mode, correſponding to their conformation: The eye, for inſtance, is not more affected with ſound than the ear with light. *2dly*, The internal ſenſe differs from the external ſenſes, by the duration of the vibrations excited by external cauſes. In every other article, both theſe ſpecies of ſenſes are of the ſame nature. The internal ſenſe of a brute, as well as its external ſenſes, are pure reſults of matter and mechanical organization. Like the animal, man poſſeſſes this internal material ſenſe; but he is likewiſe endowed with a ſenſe of a very different and ſuperior nature, reſiding in that ſpiritual ſubſtance which animates us, and ſuperintends our determinations.

Hence the brain of an animal is a general ſenſe, which receives all impreſſions tranſmitted to it by the external ſenſes; and theſe impreſſions or vibrations continue longer in the inter-

nal than the external fenfes. Of this fact we may eafily form a conception, fince the duration of impreffions, even on the external fenfes, is very different. The impreffion of light on the eye is well known to laft much longer than that of found on the ear. A rapid fucceffion of founds can be heard diftinctly; but a fucceffion of colours equally rapid confounds the eye. It is for this reafon that the vibrations tranfmitted to the internal fenfe by the eye are ftronger than thofe conveyed by the ear, and that we defcribe objects which we have feen in a more lively manner than thofe we have heard. The vibrations excited by objects on the eye feem to continue longer than thofe made upon any of the other fenfes; and, therefore, it appears to participate more of the nature of the internal fenfe. This might be proved by the quantity of nerves expanded on the eye; for it alone receives nearly as many as the three organs of hearing, fmelling, and tafting.

The eye, therefore, may be regarded as a continuation of the internal fenfe. It confifts, as was remarked in another place, almoft entirely of nervous fibres, and is only a prolongation of the organ in which the internal fenfe refides. It is not, of courfe, furprifing that this fenfe fhould make the neareft approach to the internal fenfe. Its impreffions are not only more durable, but, like the internal fenfe, it poffeffes powers

powers of a nature ſuperior to thoſe of the other ſenſes.

The eye exhibits external marks of internal impreſſions. It expreſſes deſire or averſion excited by agreeable or diſagreeable objects. Like the internal ſenſe, it is active; but all the other ſenſes are purely paſſive: They are ſimple organs, deſtined for the reception of external impreſſions, but incapable of preſerving or reflecting them.

When any of the ſenſes, it muſt be allowed, are long and ſtrongly acted upon, the vibrations continue ſome time after the action of the object has ceaſed. But the eye poſſeſſes this power in a ſupereminent degree; and it is only exceeded by the brain, which not only preſerves the impreſſions received, but propagates their action by communicating vibrations to the nerves. The external organs of ſenſe, the brain, the ſpinal marrow, and the nerves, which are expanded over the whole body, ought to be regarded as one continued maſs, as an organic machine, of which the ſenſes are the parts to which the action of external objects is applied. The brain is the fulcrum or baſis; and the nerves are the parts which receive motion from the acting powers. But what renders this machine different from all others is, that its fulcrum not only reſiſts and re-acts, but is even active itſelf; becauſe it long retains received impreſſions. And, as this internal ſenſe, the brain

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and its membranes, is very large, and endowed with great ſenſibility, it can admit many ſucceſſive and contemporary vibrations, and retain them in the ſame order they were received; becauſe each impreſſion communicates vibrations to one part only of the brain, and ſucceſſive impreſſions affect the ſame part, or contiguous parts, in a different manner.

If we ſuppoſe an animal deprived of a brain, but endowed with an external ſenſe of great extent and ſenſibility, as an eye, for example, having a retina as large as the brain, and poſſeſſing the faculty of retaining received impreſſions; it is certain, that an animal of this kind would ſee, at the ſame time, both preſent objects, and thoſe which it had formerly ſeen; becauſe, on this ſuppoſition, the vibrations always remaining, and the extent of the retina being large enough to receive them on different parts, the animal would perceive, at the ſame time, both preſent and paſt objects; and would, therefore, be mechanically determined to act according to the number or force of the vibrations produced by the images, correſponding with, or oppoſite to, this determination. If the number of images fitted to excite deſire ſurpaſſed thoſe ſuited to produce averſion, the animal would neceſſarily be determined to move, in order to gratify this appetite: But, if the number and force of different images were equal, the animal, having no ſuperior motive, would remain at reſt. I ſay, that

that all this would happen mechanically, and without the intervention of memory; for, by seeing and being acted upon by all the images at the same time, those which correspond with desire would be opposed by those that correspond with aversion, and from this equilibrium, or from the excess in number or force of one set of images above another, the animal could alone be determined to rest or to action.

From these facts it appears, that, in brutes, the internal sense differs only from the external senses, by the faculty it possesses of retaining received impressions. This faculty is alone sufficient to explain all the actions of animals, and to give us some idea of what passes within them. It likewise demonstrates the essential and infinite difference between them and us, and, at the same time, enables us to distinguish what we possess in common with them.

Animals have some senses of exquisite acuteness; but, in general, they are not all equal to those of man: And, it is worthy of remark, that the degrees of excellence in the senses follow not the same order in the brute, as in the human species. The sense most analogous to thinking is that of touch; and this sense is more perfect in man than in the other animals. The sense of smelling is most analogous to instinct and appetite; and the brute enjoys it in a superior degree. Hence man should excell in knowledge, and the brute in appetite. In man, the

first sense for excellence is touching, and smelling is the last: In the brute, the sense of smelling is the first, and that of touching is the last. This difference has a perfect correspondence to the nature of each. The sense of seeing is exceeding imperfect and delusive, without the aid of that of touching; and the former, accordingly, is less perfect in the brute than in man. The ear, though perhaps equally well constructed in the animals as in man, is not nearly so useful to them, because they are deprived of speech, which, in man, depends on the ear, an organ which gives activity to this sense, and enables him to communicate his ideas: But hearing, in the brute, is a sense almost entirely passive. Hence man enjoys the senses of touching, seeing, and hearing, more perfectly, and that of smelling more imperfectly, than the animal; and, as taste is an internal smelling, and is more analogous to appetite than any of the other senses, the animals also possess it in a superior degree, as appears from their invincible aversion against certain aliments, and their natural appetite for such as correspond to their constitutions: But man, if he were not instructed, would eat the fruit of the mancinella like an apple, and the hemlock like parsley.

The excellence of the senses is the gift of Nature; but art and habit may bestow on them a greater degree of perfection. A musician, whose ear is accustomed to harmony, is shocked with discord:

difcord: A painter, with one glance of his eye, perceives a number of fhades which efcape a common obferver. The fenfes, and even the appetites of animals, may alfo be improved. Some birds learn to fing, and to repeat words; and the ardour of a dog for the chafe may be increafed by rewarding him for his labours.

But this excellence and improvement of the fenfes are moft confpicuous in the brute, who always appears to be more active and intelligent in proportion to the perfection of his fenfes. Man, on the contrary, has too great a portion of reafon and genius to beftow much attention to the improvement of his ear or his eye. Perfons who are fhort-fighted, dull of hearing, or infenfible of fmell, fuffer not, for that reafon, any diminution of capacity: An evident proof that man is endowed with fomething fuperior to an internal animal fenfe, which is a material organ, fimilar to the external organs of fenfation, and differs from them only by the faculty of retaining received impreffions. But the foul of man is a fuperior fenfe, or fpiritual fubftance, totally different, both in its action and effence, from the nature of the exernal fenfes.

We mean not, however, to maintain that man is not poffeffed of an internal material fenfe, analogous to the external fenfes. Infpection alone is fufficient to eftablifh this point. In man, the brain is proportionally larger than in any other animal, which is an evident proof of his

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being endowed with this internal material ſenſe. What I mean to inculcate is, that this ſenſe is infinitely ſuperior to the other. It is ſubject to the commands of the ſpiritual ſubſtance, which, at pleaſure, ſuppreſſes or gives riſe to all its operations. In the animal, this ſenſe is the principle which determines all its movements; but, in man, it is only an intermediate and ſecondary cauſe of action.

But, let us examine more cloſely the powers of this internal material ſenſe. When we have once fixed the extent of its action, every thing beyond this limit muſt, of neceſſity, originate from the ſpiritual ſenſe, and we will be furniſhed with a criterion for diſtinguiſhing what we poſſeſs in common with the other animals, and in what articles we excel them.

The internal material ſenſe receives indifferently every impreſſion conveyed by the external ſenſes. Theſe impreſſions proceed from the action of objects, and quickly paſs through the external ſenſes, where they only excite momentary vibrations. But their progreſs ſtops at the brain, and produce, in this organ of the internal ſenſe, vibrations which are both diſtinct and durable. Theſe vibrations give riſe to deſire or averſion, according to the preſent ſtate and diſpoſition of the animal. Immediately after birth, the young animal begins to reſpire, and to feel a deſire for food. The organ of ſmelling receives the effluvia of the milk contained in the dugs of the

mother.

mother. Vibrations are excited in this ſenſe by the odorous particles, and theſe vibrations are tranſmitted to the brain, which, in its turn, acts upon the nerves; and the animal is thus ſtimulated to make the proper movements, or, in other words, to open its mouth, in order to procure the nouriſhment deſired. The ſenſes peculiar to appetite being more obtuſe in man than in the brutes, the new-born child feels only the deſire of taking nouriſhment, which he announces by crying. But he is incapable of procuring it himſelf; neither is he ſtimulated by the ſenſe of ſmelling; his mouth muſt be applied to the breaſt, before he can uſe the means of gratifying his appetite. Then, indeed, the ſenſes of ſmelling and of touching communicate vibrations to the brain, which, by re-acting on the nerves, ſtimulates the child to make the neceſſary motions for receiving and ſucking the milk. It is only by the ſenſes of appetite, namely, thoſe of ſmelling or taſting, that the brute animal is appriſed of the preſence of nouriſhment, or of the place where it is to be found. Its eyes are not yet open; and, though they were, they would not, at firſt, be capable of determining it to uſe the proper efforts. The eye, which is a ſenſe more analogous to intelligence than to appetite, is open in man from the moment of birth; but remains ſhut, in moſt other animals, for ſeveral days. The ſenſes of appetite, on the contrary, are more perfect and mature in the young animal

animal than in the infant. This circumſtance affords another proof, that, in man, the organs of appetite are leſs perfect than thoſe of intelligence; and that, in the animal, the organs of intelligence are more imperfect than thoſe of appetite.

The ſame remark may be made with regard to progreſſive motion, and all the other external movements. It is long before the infant can uſe its members, or has ſtrength enough to change place. But a young animal ſoon acquires theſe faculties. Theſe powers, in the animal, are all relative to appetite, which is vehement, quickly unfolded, and the ſole principle of motion. But appetite, in man, is feeble, long before it is unfolded, and ought not to have ſuch influence, as intelligence, upon the determination of his movements. Man, therefore, is, in this reſpect, later in arriving at maturity.

Hence, every circumſtance, even in phyſics, concurs in demonſtrating that the brutes are actuated by appetite only, and that man is influenced by a ſuperior principle. The only doubt that remains is the difficulty of conceiving how appetite alone ſhould produce, in animals, effects ſo ſimilar to thoſe produced in men by intelligence; and how to diſtinguiſh the actions we perform, in conſequence of our intellectual powers, from thoſe which originate from the force of appetite. I deſpair not, however, of being able to remove this difficulty.

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The internal material ſenſe, as formerly remarked, retains, for a long time, the vibrations it receives. This ſenſe, the organ of which is the brain, is common to every animal, and receives impreſſions tranſmitted to it by each of the external ſenſes. When an object acts upon the ſenſes, this action produces laſting vibrations in the internal ſenſe, and theſe vibrations communicate motion to the animal. When the impreſſion proceeds from the ſenſes of appetite, the movement is determined, the animal either advances to lay hold of the object, or flies to avoid it. This motion may be uncertain, when the impreſſion is tranſmitted by the ſenſes analogous to intelligence, as the eye, and the ear. When an animal ſees or hears for the firſt time, he feels the impreſſion of light or of ſound; but the motions produced muſt be uncertain, becauſe theſe ſenſes have no relation to appetite. It is only by repeated acts, and after the animal has joined to the impreſſions of ſeeing or hearing thoſe of ſmelling, taſting, or touching, that he feels a determination to approach or retire from objects which experience alone renders analogous to his appetite.

To illuſtrate this ſubject, let us examine the conduct of an animal that has been inſtructed by man. A dog, for example, though excited by the moſt violent appetite, will not venture to wreſt, from the hand of his maſter, the object that would gratify him; but he, at the ſame time, makes

makes a number of movements in order to obtain it. Does not the dog, in this cafe, feem to combine ideas? Does he not appear to defire, and to fear, in a word, to reafon nearly in the fame manner as a man, when violently tempted to take what belongs to another, but is reftrained by the fear of punifhment? This is the vulgar mode of accounting for the conduct of animals. We naturally transfer our own motives to animals, when placed in fimilar circumftances; and the analogy is faid to be well founded, becaufe in man, and in the animal, the conformation of both the internal and external fenfes is fimilar. Though this analogy, however, were juft, is not fomething more required? Is it not neceffary that the animals fhould, on fome occafions, do every thing which we perform? But the contrary is evident: Animals never invent, nor bring any thing to perfection; of courfe, they have no reflection; they uniformly do the fame things in the fame manner. This deftroys the force of the analogy fo much, that we may even doubt of its reality: We ought, therefore, to inquire, whether the actions of brutes proceed not from principles entirely different from thofe which actuate men, and whether their fenfes alone are not fufficient to produce their actions, without the neceffity of afcribing to them the powers of reflection.

Their internal fenfe is ftrongly agitated by every thing that relates to their appetites. A

dog

dog would inftantly feize the object he defires, if his internal fenfe retained not impreffions of pain, that had formerly accompanied this action. But the animal has received new qualities from external impreffions: This prey is not prefented to a fimple dog, but to a dog that has been beat: Every time he implicitly obeyed the dictates of appetite, has been followed with blows: The impreffions of pain, therefore, uniformly accompany thofe of appetite, becaufe they have always been made at the fame time. The animal being thus acted upon at once, by two contrary impulfes, which mutually deftroy each other, he remains in equilibrio, between two equal powers. The caufe determining him to motion being counterbalanced, he makes no effort to obtain the object of his defire. But, though the vibrations occafioned by appetite and averfion, or by pleafure and pain, deftroy the effects of each other, a third vibration, which always accompanies the other two, is renewed in the brain of the animal, by the action of his mafter, from whofe hand he has often received his food: And, as this third vibration is not counterbalanced by any oppofite power, it becomes a caufe fufficient to excite motion. The dog is, therefore, determined to move towards his mafter, and to frifk about till his appetite be fully gratified.

In the fame manner, and upon the fame principles, may all the actions of animals, however complicated they appear, be explained, without the

the neceſſity of attributing to them either thought or reflection. Their internal ſenſe is ſufficient to produce every motion they perform. One thing only remains to be illuſtrated, and that is the nature of their ſenſations, which, accordin[g] to the preſent doctrine, muſt be very different from ours. Have the animals, it may be aſked, no knowledge, no ſentiment, or no conſciouſneſs of their exiſtence? Since you pretend to explain all their actions by mechaniſm, do you not reduce them to mere machines, or inſenſible automatons?

If I have properly explained myſelf, the reader ought to perceive, that, ſo far from depriving animals of all powers, I have already allowed them the poſſeſſion of every thing but thought and reflection. Their feelings are even more exquiſite than ours. They are conſcious of their actual or preſent exiſtence; but they have no knowledge of that exiſtence which is paſt. They have ſenſations; but they want the faculty of comparing them, or of forming ideas; for ideas are only the reſults of the aſſociation or compariſon of ſenſations.

Let us conſider each of theſe articles ſeparately. The feelings of animals are more exquiſite than thoſe of man. This, I imagine, has already been ſufficiently proved by what was remarked concerning the excellence of their ſenſes relative to appetite; by their natural and invincible averſion againſt certain objects, and their

uniform and determined attachment to others; and by their faculty of inftantly diftinguifhing with certainty what is falutary or noxious. Animals, therefore, as well as men, are capable of pleafure and pain. They have no knowledge of good and evil; but they feel the diftinction. Whatever is agreeable to them is good, and whatever is difagreeable is bad. Both are only relations conformable or repugnant to their nature and organization. The pleafure of tickling, and the pain of a wound, are common to us and the animals; becaufe they depend abfolutely upon an external material caufe, namely, a weaker or ftronger action in the nerves, which are the organs of fenfation. Every thing that acts gently on thefe organs gives pleafure; and every thing that acts with violence excites pain. All fenfations, then, are fources of pleafure, when they are temperate and natural; but, when too violent, they produce pain, which, in phyfics, is the extreme, rather than the oppofite of pleafure.

Difagreeable fenfations are excited by a light too brilliant, too near an approach to fire, loud noifes, ftrong fmells, infipid or coarfe victuals, and hard friction. But a gentle light, a moderate heat, a foft found, a delicate perfume, a fine favour, and flight friction, produce fenfations of the moft agreeable kind. Thus every gentle application to the fenfes is pleafure, and every fhock, or violent impreffion, is pain. As the caufes,

caufes, therefore, which give rife to violent impreffions, occur more feldom in nature than thofe that produce foft and moderate movements; and as animals, by the exercife of their fenfes, foon acquire the habit of avoiding hurtful objects, and of diftinguifhing and approaching fuch as are agreeable to them, the fum of agreeable fenfations muft exceed that of the difagreeable; and therefore the quantity of pleafure muft be greater than that of pain.

If animal pleafure confifts of whatever flatters the fenfes, and if, in phyfics, what flatters the fenfes be every thing that correfponds to Nature; if, on the other hand, pain be whatever wounds the organs, and is repugnant to Nature; if, in a word, pleafure be phyfical good, and pain phyfical evil, it is evident, that every fentient being muft enjoy more pleafure than pain; for every thing that correfponds with his nature, contributes to his prefervation, or fupports his exiftence, is pleafant; and every thing that tends to his deftruction, to derange his organization, or to change his natural condition, is pain. It is by pleafure alone, therefore, that a fentient being can continue to exift; and, if the fum of agreeable fenfations furpaffed not that of the difagreeable, deprived of pleafure, he would firft languifh for want of good, and, loaded with pain, he would next perifh by a fuperabundance of evil.

In man, physical good and evil constitute the smallest part of his pleasures and pains. His imagination, which is never idle, is a constant source of unhappiness; for it presents to the mind nothing but vain phantoms, or exaggerated pictures. More occupied by these illusions than by real objects, the mind loses both its faculty of judging and its empire: It compares chimeras only; it sees only at second hand, and often sees impossibilities. The will, of which the mind has now no command, becomes a burden: In fine, his extravagant desires are real pains, and his vain hopes are at most but false pleasures, which vanish as soon as the mind resumes its faculty of discerning and of judging without passion.

Thus, when we search for pleasure, we create to ourselves pain; we are miserable from the moment we desire to augment our happiness. Good exists only within ourselves, and it has been bestowed on us by Nature; evil is external, and we go in quest of it. The peaceable enjoyment of the mind is our only true good: We cannot augment this good, without the danger of losing it: The less we desire, the more we possess: Whatever we wish beyond what Nature has bestowed on us is pain; and nothing is pleasure but what she offers us.

Now, pleasures innumerable are constantly presented to us by Nature: She has provided for our wants, and fortified us against pain: Physical

cal good infinitely exceeds phyſical evil. It is not, therefore, realities, but chimeras, which we ought to dread. Neither bodily pain, nor diſeaſe, nor death, are formidable; but agitation of mind, the paſſions, and languor, are the only evils we have to apprehend.

The animals have only one mode of acquiring pleaſure, the exerciſe of their ſenſations to gratify their deſires. We alſo poſſeſs this faculty: But we are endowed with another ſource of pleaſure, the exerciſe of the mind, the appetite of which is the deſire of knowledge. This ſource of pleaſure would be more pure and copious, were its current not interrupted by our paſſions, which deſtroy all contemplation. Whenever they obtain the aſcendant, reaſon is ſilenced, or only makes feeble and unavailing efforts. We, of courſe, loſe all reliſh of truth; the charm of illuſion augments; error fortifies its dominion, and drags us on to miſery: For what miſery can be greater than no longer to ſee things as they are, to have the faculty of judging perverted by paſſion, to act only according to its dictates, to appear, conſequently, unjuſt or ridiculous to others, and laſtly, to be obliged to deſpiſe ourſelves, whenever we can command a moment's reflection?

In this ſtate of darkneſs and illuſion, we would willingly change the nature of the ſoul; ſhe has been beſtowed on us for the purpoſes of knowledge, and we would employ her only for thoſe

of

of fenfation. If we could extinguifh her light entirely, inftead of regretting the lofs, we would envy the condition of idiots. As we only reafon by intervals, and as thefe intervals are burdenfome to us, and pafs in fecret reproaches, we wifh to fupprefs them. Thus, proceeding always from illufion to illufion, we voluntarily feek to lofe fight of ourfelves, and to terminate the whole by forgetting our exiftence.

Uninterrupted paffion is madnefs; and madnefs is the death of the foul. Violent paffions, with intervals, are paroxyfms of folly, difeafes of the mind, whofe danger confifts in their frequency and duration. Wifdom is only the fum of thefe intervals of health which we enjoy between the paroxyfms of paffion, and this fum is not entirely made up of happinefs: for we then perceive that the mind has been difeafed; we accufe our paffions; we condemn our actions. Folly is the germ of mifery, which wifdom unfolds. Moft people who call themfelves unhappy, are paffionate men, or, in other words, fools, who have fome intervals of reafon, during which they perceive their folly, and, of courfe, feel their mifery: And as, in the elevated conditions of life, there are more falfe appetites, more vain pretenfions, more difordered paffions, more abufe of the mind, than in the inferior, men of birth and opulence muft unqueftionably be the moft unhappy.

But, let us turn from these melancholy objects, these humiliating truths, and consider the wise man, who alone merits examination. He is both master of himself and of events. Content with his condition, he desires not to live in any other manner than he has always lived: Possessed of sufficient resources, he seldom requires the aid of others. Occupied perpetually in exercising the faculties of his mind, he improves his understanding, cultivates his genius, acquires fresh sources of knowledge; and, being neither tormented with disgust nor remorse, he enjoys the universe, by enjoying himself.

Such a man is, doubtless, the happiest being in Nature. To the pleasures of the body, which he possesses in common with the other animals, he joins those of the mind, that are peculiar to him. He has two modes of being happy, which mutually aid and fortify each other; and if, by disease or accident, he be afflicted with pain, he suffers less than the fool: He is supported by the strength of his mind, and reason affords him consolation: Even in suffering pain, he has the pleasure of perceiving that he is able to endure it.

Health, in man, is more feeble and precarious than in any other animal. He is oftener sick; his sickness is of longer duration; and he dies at every age. The brutes, on the contrary, seem to run through the space allotted to their existence with firm and equal steps. This circum-

stance

ſtance appears to proceed from two cauſes, which, though very different, mutually contribute to produce the ſame effect. The firſt is the agitation of mind occaſioned by the derangement of our internal material ſenſe. The paſſions have an influence on health, and introduce diſorder into the vital principles. The majority of men lead either a timid or contentious life, and moſt of them die of chagrin. The ſecond is the imperfection of thoſe of our ſenſes which are analogous to appetite. The brute animals diſtinguiſh better what is agreeable to their nature: They are never deceived in the choice of their aliment; they never exceed in their pleaſures; guided by the perception of their actual wants only, they remain ſatisfied, and never ſearch for new ſources of gratification. But man, independent of wiſhing for exceſs in every article, independent of that ardour with which he ſeeks to deſtroy himſelf by attempting to force Nature, is not ſo alert in diſtinguiſhing the effects of particular ſpecies of food. He deſpiſes ſimple aliment, and prefers compounded diſhes, becauſe his taſte is corrupted, and becauſe he has converted the ſenſe of pleaſure into an inſtrument of debauchery, which can only be gratified by irritation.

It is not, therefore, ſurpriſing that we are more ſubject to diſeaſes than the brutes, ſince we cannot, like them, diſtinguiſh ſo eaſily what is noxious or ſalutary to our frame. Our experi-

ence, in this article, is less certain than their sentiment. Besides, we even abuse those sensations of appetite, which they possess in a more perfect degree: In brutes, these sensations are the means of health and preservation; but, in man, they become the causes of malady and destruction. Intemperance alone is more fatal to man than the united force of all the other evils incident to human nature.

By these considerations we are led to believe, that the feelings of animals are more determined and more exquisite than ours; for, though it were allowed that brutes frequently poison themselves, it must likewise be granted, that they never take poison but when concealed among other food, or when so pressed with hunger, that they eat whatever is presented to them; and many instances have occurred where animals have perished for want, rather than eat what was repugnant to their constitution.

The superior strength of sentiment in brutes may be still farther proved, by attending to their sense of smelling, which, in most animals, is so powerful, that they smell farther than they see: They not only scent actual objects at a distance, but they can trace them, by their effluvia, long after they are gone. Such a sense is an universal organ of perception; it is an eye that sees objects, not only where they are, but where they have been. In a word, it is a sense by which the animal is enabled to distinguish with certainty

ty what is agreeable to its nature, and by which it perceives what is fitted to gratify its appetite. Hence brute animals enjoy, in a superior degree, the senses relative to appetite; and, of course, have feelings more exquisite than those of men. They are likewise conscious of their actual existence; but retain no consciousness of their past existence. This latter proposition, as well as the first, merits consideration.

In man, consciousness of existence is composed of the perception of actual existence, as well as remembrance of past existence. Remembrance is a perception equally present with the first impression; it even sometimes affects us more strongly than actual sensations. As these two species of sensation are different, and as the mind has the faculty of comparing and forming ideas from them, the consciousness of our existence is more certain and extensive, in proportion to the number and frequency of past objects recalled by the memory, and to the frequent combining and comparing of them with each other, and with present objects. Each object is accompanied with a certain number of sensations, or different existences, relative to the different states in which it was originally perceived. This number of sensations, by the comparison made between them by the mind, becomes a succession or train of ideas. The idea of time, and indeed every other idea, originates from the comparison of our sensations. But this train of ideas, or of

 existences,

existences, often presents itself to us in an order or arrangement very different from that in which our sensations were received. It is the arrangement of our ideas that we perceive, and not the order of our sensations; and in this consist chiefly the differences of character and of genius; for two men, though similar in organization, and educated in the same manner, and though they received their sensations in the same order, might, notwithstanding, think very differently. As the temperament of their minds was not the same, and as each combined and compared similar sensations in a manner peculiar to himself, the general results of these comparisons, or the ideas, genius, and character acquired, would likewise be different.

Some minds are peculiarly active in comparing sensations and forming ideas. Such men are always the most ingenious, and, if not prevented by circumstances, make the most brilliant figure in life. There are others, whose minds, being more obtuse, allow every sensation to escape, but such as make strong impressions: these men have less genius and vivacity than the former. Lastly, there are other men, and these constitute the multitude, who have so little activity of mind, and so great an aversion to thinking, that they never compare or combine sensations, at least, quickly. The sensations must be strong, and repeated a thousand times, before their minds can be roused to compare them,

them, or to form ideas. These men are exceedingly stupid, and differ from the brutes only by the small number of ideas which their minds have formed with so much labour.

The consciousness of our existence being thus composed not only of our actual sensations, but of the train of ideas which results from a comparison of our sensations, and of our past existence, it is evident, that the more ideas a man possesses, he is more certain of his existence; that his existence is proportioned to his genius; and that, by the power of reflection alone, we are conscious of our former existence, and that we will continue to exist, the idea of future being only the inverse comparison of the present with the past; for, in this view, the present is past, and the future present.

Now, the power of reflection being denied to brutes, it is obvious that they cannot form ideas, and, consequently, that the consciousness of their existence must be less certain and less extensive than ours; for they have no idea of time, no knowledge of the past, or of the future. Their consciousness of existence is simple; it depends solely on the sensations which actually affect them, and consists of the internal feelings produced by these sensations.

We may, perhaps, acquire some notion of the consciousness of existence which animals possess, by reflecting on our own condition, when strongly

ſtrongly occupied with any object, or ſo violently agitated with paſſion as to preclude every reflex idea of ourſelves. This condition is expreſſed by ſaying, A man is abſent, or out of himſelf. We are out of ourſelves when fully immerſed in actual ſenſations, and eſpecially when theſe ſenſations are violent, rapid, and leave the mind no leiſure to reflect. In this ſtate, we feel every degree of pleaſure and pain; we even retain the conſciouſneſs of our exiſtence, without any ſenſible participation of the mind. This condition, in which we have momentary impreſſions of our exiſtence only, is the habitual ſtate of animals; deprived of ideas, and furniſhed with ſenſations, they know not their exiſtence, but they feel it.

To illuſtrate this difference more fully, let us compare the powers and actions of brute animals with thoſe of man. Like us, they have ſenſes, and receive impreſſions from external objects. They have alſo an internal ſenſe, an organ which retains the vibrations excited by theſe impreſſions; and, conſequently, ſenſations, which, like ours, may be renewed, and are more or leſs ſtrong and durable. Still, however, they have neither imagination, underſtanding, nor memory; becauſe they poſſeſs not the power of comparing their ſenſations, and becauſe theſe three faculties of the mind depend upon this power.

Have

Have brute animals no memory? The contrary, I ſhall be told, is demonſtrably evident: Do they not recollect, after long abſence, the perſons with whom they have lived, the places where they dwelt, the roads they frequented? Do they not remember the chaſtiſements they had ſuffered, the careſſes they had received, the leſſons they had been taught? Every thing concurs in ſhowing that, though deprived of imagination and reaſon, they poſſeſs an active, extenſive, and, perhaps, more faithful memory than our own. But, however ſtriking theſe appearances may be, and however ſtrong the prejudices to which they have given riſe, I imagine it is capable of demonſtration, that they are deceitful, and that brutes have no knowledge of paſt events, no idea of time, and, of courſe, no memory.

In man, memory originates from the faculty of reflection; for our remembrance of paſt events ſuppoſes not only a continuation of the impreſſions made upon the internal material ſenſe, or a renewal of former ſenſations, but likewiſe the compariſon the mind makes between its ſenſations, or the ideas it forms. If memory conſiſted not in the renovation of paſt ſenſations, theſe ſenſations would be repreſented in our internal ſenſe, without leaving any determined impreſſions; they would be exhibited without order or connection, like the ravings of perſons mad or intoxicated, where objects are ſo deranged

ranged and confufed, that no remembrance of them is retained; for we cannot remember things that have no relation to thofe which have preceded or followed them. No ifolated fenfation, however ftrong, can leave any traces on the mind. Now it is the mind alone that afcertains the relations of objects, by the comparifon it makes between them, and connects our fenfations by a continued train of ideas. Memory, therefore, confifts in a fucceffion of ideas, and neceffarily fuppofes the exiftence of the power by which they are produced.

But, to leave no room for doubt on this important point, let us examine that fpecies of remembrance left by our fenfations, when unaccompanied with ideas. Pain and pleafure are fenfations of the pureft and ftrongeft kind; yet our recollection of thefe feelings is feeble and confufed. We only remember that we felt pleafure or pain; but our remembrance is indiftinct: We cannot figure either the fpecies, the degree, or the duration of thofe feelings which affected us fo powerfully; and ftill lefs are we able to have clear ideas of thofe which have been feldom repeated. A violent pain, for example, which is felt but once, continues only a few moments, and differs from all former pains, would neceffarily be foon forgot. We might recollect that we felt a great pain; but, while we diftinctly remember the circumftances which attended it, and

and the time when it happened, we would have only a faint impression of the sensation itself.

Why is every thing that passed in our infancy entirely obliterated? Why do old men recollect what happened in their youthful years better than what occurred during their old age? Can there be a stronger proof that sensations alone are insufficient for the production of memory, and that it has no existence but in the train of ideas which the mind forms from its sensations? In infancy, our sensations are perhaps as lively and rapid as in middle age; yet they leave little or no traces behind them; because, at this period, the power of reflection, which alone forms ideas, is almost totally inactive; and, when it does act, its comparisons are superficial, and it is incapable of reducing objects to any regular arrangement. At the age of maturity, reason is fully unfolded, because the power of reflection is at its meridian. We then derive from our sensations all the fruit they can produce, and we form various orders of ideas and change of thought, each of which, by being frequently revolved, makes an impression so deep and indelible, that, when old age arrives, the same ideas recur with more force than those derived from present sensations; because, at that period, our sensations are slow and feeble, and the mind itself participates the languor of the body. Infancy is totally occupied with the present time: In mature years, we enjoy equally the past, the present, and the future; and,

and, in old age, we have but slight feelings of the present, we turn our eyes to futurity, and live only in the past. Do not these differences depend entirely on the arrangement the mind has made of its sensations? and are they not more or less connected with the faculty we possess, at different ages, of forming, acquiring, and retaining ideas? Neither the prattling of the child, nor the garrulity of old age, have the tone of reasoning, because they are equally deficient in ideas; the first is yet unable to form them, and the last has lost that faculty.

An idiot, whose senses and bodily organs appear to be perfectly sound, possesses, in common with us, every kind of sensation, and, if he lived in society, and were obliged to act like other men, he would possess them in the very same order. But, as these sensations give rise to no ideas; as there is no correspondence between his mind and his body; and, as he has not the faculty of reflection; he is, of course, deprived of memory, and of all knowledge of himself. With regard to external powers, this man differs not from the brutes; for, though he has a soul, and possesses the principle of reason, as this principle remains inactive, and receives no intelligence from the bodily organs, it can have no influence on his actions, which, like those of the brute animals, are determined solely by his sensations, and by the consciousness of his actual existence and present wants. Thus an idiot and a brute

are beings whoſe operations are in every reſpect the ſame; becauſe the latter has no ſoul, and the former makes no uſe of it: Both want the power of reflection, and, conſequently, have neither underſtanding, imagination, nor memory; but they both poſſeſs ſenſations, feelings, and the faculty of moving.

If it ſhall ſtill, however, be aſked, Do not idiots and brutes often act as if they were determined by the knowledge of paſt objects? Do they not recollect the perſons with whom they have lived, the places where they dwelt, &c.? Do not theſe actions neceſſarily imply the exertions of memory? and does not this prove that memory flows not from the power of reflection?

The reader ought to recollect, that I have already diſtinguiſhed two ſpecies of memory, which, though they reſemble each other in their effects, proceed from very different cauſes: The firſt is occaſioned by the impreſſions of our ideas; and the ſecond, which I would rather call reminiſcence than memory, is only a renewal of our ſenſations, or of the vibrations that produce them. The firſt is an emanation of the mind, and, as already remarked, is more perfect in man than the ſecond. But the latter is only a renovation of the vibrations of the internal material ſenſ[illegible]d it alone is poſſeſſed by idiots and brutes. Their former ſenſations are renewed by actual ſenſations; the principal and preſent

prefent recall the acceffary and paft images; they feel as they formerly felt, and confequently act as they formerly acted; they perceive the prefent and the paft; but they have not the capacity of diftinguifhing or comparing objects, and, of courfe, have no proper knowledge of them.

I am aware that dreams will be adduced as another proof of the memory of brutes. It is undeniable, that the objects which occupy animals when awake, are likewife prefented to them during fleep. Dogs bark in their fleep; and, though this barking be feeble, it is eafy to diftinguifh the founds peculiar to the chafe, to anger, to defire, to complaint, &c. It is, therefore, unqueftionable, that dogs have a lively and active memory, and very different from what has been above defcribed, fince it acts independent of external caufes.

To obviate this difficulty, we muft examine the nature of dreams, and inquire whether they proceed from the mind, or depend folely on our internal material fenfe. If we can prove that they refide entirely in the latter, the objection will not only be removed, but a new argument will be furnifhed againft the underftanding and memory of brutes.

Idiots, whofe minds are totally inactive, dream like other men: Dreams, therefore, are produced independent of the mind. Brute animals, though they have no mind, not only dream, but

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I am tempted to think that all dreams are independent of mind. Let any man reflect upon his dreams, and endeavour to discover why the parts of them are so ill connected, and the events so ridiculous and absurd. The chief reason, I have always thought, proceeds from this circumstance, that dreams are entirely derived from sensations, and not from ideas. The idea of time, for example, never enters into dreams: Persons whom we never saw are represented; we even see those who have been long dead in the same form as when they were alive; but they are always connected with present objects and persons, or with those which are past. It is the same with the idea of place: In dreams we never see persons where they are; objects must be seen where they are not, or they cannot be perceived at all. If the mind acted, it would instantly reduce this chaos of sensations to order. But, instead of acting, the mind generally allows these illusory representations to succeed each other in the order they occur; and, though each object appears in lively colours, the succession is often confused, and always chimerical. If, however, the mind be half roused by the absurdity of the representations, or by the mere force of the sensations, a glimmering of light breaks in upon the darkness, and produces a real idea in the midst of chimeras; we then begin to dream, or rather to think, that the whole may be only a dream. Though this action be only a feeble exertion of

the mind; it is neither a ſenſation nor a dream; it is a real thought or reflection; but, as it has not ſtrength enough to diſſipate the illuſion, it mixes with, and becomes part of the dream, and allows the ſucceſſion of images to proceed; ſo that, when we awake, we imagine we have dreamed what we in reality thought.

In dreams we ſee much, but ſeldom underſtand: Though we feel in the moſt lively manner, we never reaſon: Images and ſenſations ſucceed each other; but the mind never unites or compares them. We have, therefore, ſenſations, but no ideas; for ideas are the reſults of compared ſenſations. Hence dreams reſide only in the internal material ſenſe; they are produced without the intervention of the mind; and, therefore, conſtitute a part of that material or purely animal reminiſcence which we have formerly mentioned. Memory, on the contrary, cannot exiſt without the idea of time, without the actual compariſon of former ideas; and, ſince ideas enter not into dreams, it is obvious, that they can neither be a conſequence, nor an effect, nor a proof of memory. But, though ideas ſhould ſometimes accompany dreams, though the ſomnambuliſts, who walk, ſpeak ſenſibly, anſwer queſtions, &c. in their ſleep, ſhould be quoted to prove that ideas are not ſo entirely excluded from dreams as I pretend, it is ſufficient for my purpoſe that dreams may be produced by the renewal of ſenſations alone, without the inter-

intervention of mind: For then brute animals can have dreams of this ſpecies only; and theſe dreams, inſtead of ſuppoſing the exiſtence of memory, indicate, on the contrary, nothing more than a material reminiſcence.

I am, however, far from believing that ſomnambuliſts are really occupied with ideas: The mind ſeems to take no part in their actions; for, though they go about and return, they act without reflection or knowledge of their ſituation. They are neither conſcious of the dangers nor inconveniencies which accompany their expeditions. The animal faculties are alone employed, and even not the whole of them. A ſomnambuliſt, therefore, is in a more ſtupid ſtate than that of an idiot; becauſe he exerts a part of his ſenſes only; but an idiot employs the whole, and enjoys extenſively every ſpecies of feeling: And as to the people who ſpeak during ſleep, they never ſay any thing new. The anſwering ſome trivial queſtions, the repetition of ſome common phraſes, prove not the action of the mind: All this may be performed independent of the thinking principle. Why may not a man aſleep ſpeak without thinking, ſince perſons fully awake, eſpecially when occupied with paſſion, utter many things without reflection?

With regard to the occaſional cauſe of dreams, or the reaſon why former ſenſations are renewed, without being excited by preſent objects, it may be remarked, that we never dream during a pro-

a profound ſleep. Every thing is then extinguiſhed; we ſleep both externally and internally. But the internal ſenſe ſleeps laſt, and awakes firſt; becauſe it is more active, and more ſuſceptible of impreſſions than the external ſenſes. We dream moſt when our ſleep is leaſt perfect and profound. Former ſenſations, eſpecially thoſe which require no reflection, are renewed. The internal ſenſe, occupied with actual ſenſations, on account of the inactivity of the external ſenſes, exerciſes itſelf with its paſt ſenſations. The ſtrongeſt always preſent themſelves firſt; and the ſtronger they are, the ſuppoſed ſituations become more keenly intereſting. It is for this reaſon that dreams are almoſt perpetually either dreadful or raviſhing.

It is not even neceſſary that the external ſenſes ſhould be abſolutely lulled, before the internal ſenſe can exert its independent powers: The ſimple inaction of theſe ſenſes is ſufficient to produce this effect. The habit of going to repoſe at ſtated times often prevents us from ſleeping eaſily. The body and its members are ſoftly extended without motion: the eyes are involved in darkneſs; the tranquillity of the place, and the ſilence of the night, render the ear uſeleſs; the other ſenſes are equally inactive; all is in a ſtate of repoſe, but nothing as yet entirely lulled or aſleep. In this condition, and when the mind is alſo unoccupied with ideas, the internal material ſenſe alone exerts itſelf. This is the ſeaſon of illuſive

illusive images and fleeting shades. We are awake, and yet we feel the effects of sleep. If we be in health and vigour, the succession of images and illusions is enchanting. But, when the body is disordered, or fatigued, the images are of a different nature: We are then tormented with hideous and threatening phantoms, which succeed each other with equal caprice and rapidity. This scene of chimeras may be called a magic lanthorn which fills the brain with illusions, when void of all other sensations: The objects of this scene are more lively, numerous, and disagreeable, in proportion to the weakness of the body and delicacy of the nerves; for the vibrations occasioned by real sensations being, in a state of weakness or disease, much stronger and more disagreeable than in a healthy state, the representations of these sensations, produced by a renewal of the same vibrations, must likewise be more lively and painful.

In fine, we remember dreams for the same reason that we remember former sensations: The only difference between us and the brutes is, that we can distinguish dreams from ideas or real sensations; and this capacity of distinguishing is a result of comparison, an operation of memory, which includes the idea of time. But the brutes, who are deprived of memory and of the faculty of comparing past and present time, cannot distinguish their dreams from their actual sensations.

In the article concerning the nature of man, I imagine I have proved, in a ſatisfactory manner, that animals poſſeſs not the power of reflection. Now, the underſtanding, which is a reſult of this power, may be diſtinguiſhed by two different operations: The firſt is the faculty of comparing ſenſations, and forming ideas from them; and the ſecond is the power of comparing the ideas themſelves, and forming a chain of reaſoning. By the firſt operation, we acquire particular ideas, or the knowledge of ſenſible objects: By the ſecond, we form general ideas, which are neceſſary for the acquiſition of abſtract truths. The brute animals poſſeſs neither of theſe faculties, becauſe they have no underſtanding; and the underſtanding of the bulk of mankind ſeems to be limited to the firſt of the above operations.

If all men were equally capable of comparing and generalizing ideas, they would equally exhibit their ingenuity by new productions, which would be always different from thoſe of others, and often more perfect; all men would be endowed with inventive powers, or, at leaſt, with the capacity of improving and perfecting. But this is by no means the caſe: Reduced to a ſervile imitation, moſt men execute only what they have ſeen performed by others; they think only from memory, and in the ſame order as others have thought; their underſtanding is limited entirely to form and imitation, and their power

power of reflecting is too feeble for invention.

Imagination is another faculty of the mind: If, by imagination, we underſtand the power of comparing images with ideas, of illuminating our thoughts, of aggrandizing our ſenſations, of painting our ſentiments, in a word, of perceiving with rapidity all the qualities and relations of objects, this power is the moſt brilliant and moſt active faculty of the mind, and the brutes are ſtill more devoid of it, than of either underſtanding or memory. But there is another ſpecies of imagination, which depends ſolely on corporeal organs, and is common to us with the brutes, namely, that tumultuary emotion excited by objects analogous or oppoſite to our appetites, that lively and deep impreſſion of the images of objects, which perpetually and involuntarily recurs, and forces us to act, like the brutes, without deliberation or reflection. By this repreſentation of objects, which is more active than their preſence, every thing is exaggerated, and painted in falſe colours. This ſpecies of imagination is the grand enemy of the human mind: It is the ſource of illuſion, the mother of thoſe paſſions which, in ſpite of the efforts of reaſon, rule over us, and render us the unhappy theatre of a perpetual combat, in which we are almoſt conſtantly vanquiſhed.

HOMO DUPLEX.

The internal man is *double*. He is composed of two principles, different in their nature, and opposite in their action. The mind, or principle of all knowledge, wages perpetual war with the other principle, which is purely material. The first is a bright luminary, attended with calmness and serenity, the salutary source of science, of reason, and of wisdom. The other is a false light, which shines only in tempest and obscurity, an impetuous torrent, which involves in its train nothing but passion and error.

The animal principle is first unfolded. As it is purely material, and consists in the duration of vibrations, and the renewal of impressions formed in the internal material sense, by objects analogous or opposite to our appetites, it begins to act, and to guide us, as soon as the body is capable of feeling pain or pleasure. The spiritual principle appears much later, and is unfolded and brought to maturity by means of education only: It is by the communication of others thoughts alone that the child becomes a thinking and rational creature. Without this communication, it would be stupid or fantastical, according to the natural inactivity or activity of its internal material sense.

Let

Let us view a child when left at full liberty, and removed from the obſervation of his guide. We may judge of what paſſes within him from his external actions. He neither thinks nor reflects. He follows indifferently every path to pleaſure. He obeys all the impreſſions of external objects. He acts without reaſon. Like the young animals, he amuſes himſelf by running and bodily exerciſe. He goes and returns, without deſign or pre-conceived project. His actions are deſultory, and without order or connection. But, when called upon by his parents, or thoſe who have learned him to think, he inſtantly compoſes himſelf, gives a direction to his actions, and ſhows that he has retained the thoughts which had been communicated to him. The material principle has abſolute ſway during infancy, and would continue to reign through life, if the ſpiritual principle were not unfolded and put in motion by education.

It is eaſy, by reflection, to perceive the exiſtence of theſe two principles. There are moments, and even hours and days, in which we can diſtinguiſh with certainty both their exiſtence, and the contrariety of their action. I refer to thoſe times of indolence, of fatigue, or diſguſt, when we are unable to form any determination, when our actions and deſires are diametrically oppoſite; to that condition or diſeaſe called *vapours*, with which the ſedentary and idle are ſo often affected. If we examine ourſelves when

when in this ſtate, we will ſeem to be divided into two diſtinct beings, the firſt of which, or the rational faculty, blames what is done by the ſecond, but has ſeldom force enough to overcome it; the latter, on the contrary, being compoſed of all the illuſions of ſenſe and imagination, commands, and often overpowers the former, and forces us to act contrary to our judgment, or makes us remain idle, though we have a deſire of acting.

When the rational faculty reigns, a man feels a tranquil poſſeſſion of himſelf and his affairs; but he perceives, at the ſame time, that this is only acquirable by a kind of reluctant abſtraction from the preſence of the other principle. But, when the irrational principle aſſumes the dominion, we reſign ourſelves with ardour to diſſipation, to appetite, and to paſſion, and hardly reflect upon the very objects which occupy us ſo entirely. In both theſe ſtates we are happy: In the firſt, we command with ſatisfaction; and, in the ſecond, we have ſtill greater pleaſure in obeying. As only one of theſe principles is then in action, and is not oppoſed by the other, we are ſenſible of no internal conflict; our exiſtence appears to be ſimple, becauſe we feel but one impulſe: It is in this unity of action that our happineſs conſiſts; for, whenever reaſon accuſes our paſſions, or when the violence of paſſion makes us hate the admonitions of reaſon, we then ceaſe to be happy; we loſe the unity of

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our exiſtence, in which alone tranquillity conſiſts; an internal conflict commences; the two perſons oppoſe each other; and the two principles manifeſt themſelves by producing doubts, inquietude, and remorſe.

We may hence conclude that to be the moſt miſerable of all ſtates, when theſe two ſovereign powers of human nature exert equally their greateſt efforts, and produce an equilibrium. This is that ultimate point of diſguſt, which makes a man abhor himſelf, and leaves no other deſire but that of ceaſing to exiſt, no other power but that of arming with fury againſt himſelf.

What a dreadful condition! I have painted its darkeſt ſhade. But how many black clouds muſt precede? All the ſituations adjacent to this ſtate of equilibrium, muſt be replete with melancholy, irreſolution, and miſery. Even the body itſelf falls a victim to the agitations produced by theſe internal conflicts.

The happineſs of man conſiſts in the unity of his internal frame: During infancy, he is happy, becauſe the material principle reigns alone, and is in perpetual action. The conſtraints, remonſtrances, and even the chaſtiſements of parents, affect not the baſis of happineſs in children. No ſooner do they obtain their liberty, than they reſume all the ſpring and gaiety which they receive from the novelty and vivacity of their ſenſations. If a child were entirely left to himſelf, his

his happiness would be complete; but it would cease, and be succeeded with a long train of misery. We are therefore obliged to lay him under certain restraints, which frequently make him uneasy; but these transitory pains are the germs of all his future good.

In youth, when the mental principle begins to act, and might even serve for our guide, a new material sense springs up, and assumes such an absolute dominion over all our faculties, that the soul seems to yield itself a willing victim to the impetuous passions it excites. The material principle now gains a more complete command than it formerly possessed; for it not only subdues reason, but perverts it, and employs it as an instrument of gratification: We neither think nor act, but with a view to approve and to satisfy this passion. As long as this intoxication continues, we are happy: External opposition and difficulties seem to corroborate the unity of this internal principle; they fortify the passion; they fill the intervals of languor; they rekindle the flame, and turn all our views to the same object, and all our powers towards the accomplishment of the same end.

But this happy scene passes away like a dream; the charm vanishes; and disgust and a frightful void succeed the plenitude of agreeable feelings with which we had been occupied. The mind, when roused from this lethargy, recognises itself with difficulty. It has lost by slavery the habit of

of commanding, together with its ſtrength. It even loves ſervitude, and goes in queſt of a new tyrant, a freſh object of paſſion, which, in its turn, ſoon diſappears, and is ſucceeded by another, whoſe duration is ſtill ſhorter. Thus exceſs and diſguſt continue to multiply; pleaſure flies from our embrace; the organs are debilitated, and the material ſenſe, in place of governing, has not even the power to obey. After a youth ſpent in this manner, nothing remains but an enervated body, a feeble and effeminate mind, and a total incapacity of employing either.

It has been remarked, that, in the middle period of life, men are moſt ſubject to thoſe languors of mind, that internal malady which is diſtinguiſhed by the name of *vapours*. At this age, we ſtill ſearch after the pleaſures of youth. This is the effect of habit, and not of any natural propenſity. In proportion as we advance in years, inſtead of pleaſure, we more frequently feel the incapacity of enjoyment. Our deſires are ſo often contradicted by our weakneſs, that we condemn both our actions and the paſſions which we wiſh in vain to gratify.

It is, beſides, at this age, that cares and ſolicitude ariſe: We then aſſume a certain ſtate, or, in other words, either from chance or choice, we enter upon a particular courſe of life, which it is always ſhameful to abandon, and often dangerous to purſue. We proceed, therefore, between two rocks equally formidable, contempt and

and averſion. The efforts we make to avoid them weaken our powers, and throw a damp upon our ſpirits: For, after long experience of the injuſtice of men, we acquire the habit of regarding every individual as neceſſarily vicious; and, after we are accuſtomed to prefer our own repoſe to the opinions of the world, and after the heart, rendered callous by the frequent wounds it has received, has loſt its ſenſibility, we eaſily arrive at that ſtate of indifference, that indolent tranquillity, of which we would formerly have been aſhamed. Ambition, the moſt powerful motive of elevated minds, which is regarded at a diſtance as the nobleſt and moſt deſirable of all objects, and which ſtimulates us to the performance of great and uſeful actions, has no attractions to thoſe who have approached it, and proves a vain and deceitful phantom to thoſe who fall behind in the purſuit. Indolence takes place of ambition, and ſeems to offer all men an eaſier acquiſition of more ſolid good. But it is preceded by diſguſt, and followed by languor, that dreadful tyrant of thinking minds, againſt which wiſdom has leſs influence than folly.

It is hence apparent, that the difficulty of reconciling man to himſelf originates from his being compoſed of two oppoſite principles; and that this is the ſource of his inconſtancy, irreſolution, and languor.

Brute animals, on the contrary, whoſe nature

is ſimple and purely material, feel no internal conflicts, no remorſe, no hopes, no fears.

If we were deprived of underſtanding, of memory, of genius, and of every faculty of the ſoul, nothing would remain but the material part, which conſtitutes us animals. We would ſtill have wants, ſenſations, pleaſure, pain, and even paſſions; for what is paſſion but a ſtrong ſenſation, which may every moment be renewed? Now, our ſenſations may be renewed in an internal material ſenſe; we would, therefore, poſſeſs all the paſſions, at leaſt all thoſe which the mind, or principle of intelligence, can neither produce nor foment.

But the great difficulty is to diſtinguiſh clearly the paſſions peculiar to man from thoſe which are common to him and the brutes. Is it certain, or even probable, that the animals have paſſions? Is it not, on the contrary, agreed, that every paſſion is a ſtrong emotion of the mind? Ought we not, therefore, to ſearch ſomewhere elſe, than in the ſpiritual principle, for the ſeeds of pride, of envy, of ambition, of avarice, and of all the other paſſions which govern us?

To me it appears, that every thing which governs the mind is extraneous to it; that the principle of intelligence is not the principle of ſentiment; that the ſeeds of the paſſions exiſt in our appetites; that all illuſions proceed from the ſenſes, and reſide in our internal material ſenſe; that, at firſt, the mind has no participation in theſe

their illusions, but by its silence; and that, when the mind does give any countenance to them, it is subdued, and, when it assents, it is totally perverted.

Let us then distinguish man's physical from his moral passions: The one is the cause; the other the effect. The first emotion originates in the internal material sense: The mind may receive, but it cannot produce this emotion. Let us likewise distinguish instantaneous emotions from those that are durable, and we shall, at once, perceive, that fear, horror, anger, love, or rather the desire of enjoyment, are sensations, which, though durable, depend solely on the impressions of objects upon our senses, combined with the subsisting impressions of our former sensations; and, consequently, that those passions must be common to us and the other animals: I say, that the actual impressions of objects are combined with the subsisting impressions of our former sensations; for nothing is horrible or alluring, either to man or the brutes, when seen for the first time. This is fully proven by experience: A young animal will run into the flames the first time a fire is presented to it. Animals acquire experience only by reiterated acts, the impressions of which remain in their internal sense; and though their experience be not natural, it is not less sure, and even renders the animal more circumspect; for a great noise, a violent motion, an extraordinary figure, suddenly,

denly, and for the first time, seen or presented, produce in the animal a shock, the effect of which resembles the first impressions of fear: But this feeling is instantaneous; and, as it cannot be combined with any former sensation, it can only excite a momentary vibration, and not a durable emotion, which the passion of fear necessarily implies.

A young inhabitant of the forest, when suddenly struck with the sound of a hunter's horn, or with the report of a gun, starts, bounds, and flies off, solely from the violence of the shock which he felt. But, if this noise ceases, and has been attended with no injury, the animal recognises the ordinary silence of nature; he composes himself, stops, and returns to his peaceable retreat. But age and experience soon render him timid and circumspect. If he feels himself wounded or pursued, after hearing a particular sound, the painful sensation is preserved in his internal sense; and, whenever he again hears the same noise, the painful sensation is renewed, and, combining with the actual impression, produces a durable passion, a real fear; the animal flies with all his speed, and often abandons for ever his former abode.

Fear, then, is a passion of which brute animals are susceptible, though they feel not our rational or foreseen apprehensions. The same remarks are applicable to horror, anger, and love; though brutes have none of our reflex

 aversions,

...rsions, or durable resentments, or our constant friendships. Brute animals possess all those primary passions, which suppose no intelligence, no ideas, and are founded only on the experience of sentiment, or repeated feelings of pleasure and pain, and a renewal of former sensations of the same kind. Anger, or natural courage, is remarkable in those animals who have exerted their strength, and found it superior to that of others. Fear is the offspring of weakness; but love is common to all animals. Love is an innate desire, the soul of nature, the inexhaustible fountain of existence, the germ of perpetuity infused by the Almighty into every being that breathes the breath of life. It softens the most ferocious and obdurate hearts, and penetrates them with a genial warmth. It is the source of all good; by its attractions it unites the most savage and brutal tempers, and gives birth to every pleasure. Love! Thou divine flame! Why dost thou constitute the happiness of every other being, and bring misery to man alone? Because this passion is only a physical good. Notwithstanding all the pretences of lovers, morality is no ingredient in the composition of love. Wherein does the morality of love consist? In vanity; the vanity arising from the pleasure of conquest, an error which proceeds from our attempts to exalt the importance of love beyond its natural limits; the vanity of exclusive possession, which is always accompanied with jealousy, a passion so low, that we uniformly

uniformly wish to conceal it; the vanity proceeding from the mode of enjoyment, which only multiplies efforts, without increasing our pleasures. There is even a vanity in relinquishing the object of our attachment, if we first wish to break it off. But if we are slighted, the humiliation is dreadful, and, after discovering that we have been long duped and deceived, turns into despair.

Brute animals suffer none of these miseries. They search not after pleasure where it is not to be found. Guided by sentiment alone, they are never deceived in their choice. Their desires are always proportioned to the power of gratification. They relish all their enjoyments, and attempt not to anticipate or diversify them. But man, by endeavouring to invent pleasures, destroys those which correspond to his nature; by attempting to force sentiment, he abuses his being, and creates a void in his heart which nothing can afterwards fill up.

Thus, every thing that is good in love belongs to the brutes as well as to man; and, as if this passion could never be pure, the animals even seem to feel a small portion of jealousy. Jealousy, in the human species, always implies some distrust of ourselves, a tacit acknowledgment of our own weakness. The animals, on the contrary, seem to be jealous in proportion to their force, ardour, and habits of pleasure; because our jealousy proceeds from ideas, and theirs from

 sentiment,

ment. They have enjoyed, and they deſire to enjoy more. They feel their ſtrength, and they beat off all who endeavour to occupy their place. Their jealouſy is not the effect of reflection. They turn it not againſt the object of their love. They are only jealous of their pleaſures.

But, are animals limited ſolely to thoſe paſſions we have deſcribed? Are fear, anger, horror, love, and jealouſy, the only permanent affections they are capable of feeling? To me it appears, that independent of theſe paſſions, of which natural ſentiment, or rather the experience of ſentiment, renders animals ſuſceptible, they poſſeſs other paſſions, which are communicated to them by education, example, habit, and imitation. They have a ſpecies of friendſhip, of pride, and of ambition. And though, from what has been ſaid, it is apparent that the operations they perform are not the effects of thought or reflection; yet, as the habits we have mentioned ſeem to ſuppoſe ſome degree of intelligence, and to form the ſhade between man and the brute creation, this ſubject merits a careful examination.

Can any thing exceed the attachment of a dog to his maſter? Some of them have been known to die on the tomb in which he had been laid. But (not to quote prodigies or heroes), with what fidelity does the dog attend, follow, and protect his maſter! With what anxiety does he ſeek his careſſes! With what doci-

lity and alacrity does he obey him! With what patience does he suffer his ill humour, and even his chastisements, though often unjust! With what gentleness and humility does he endeavour to regain his favour! In a word, what agitation and chagrin does the dog discover when his master is absent; and what excess of joy on his return! In all these expressions, is it possible to mistake the genuine characters of friendship? Are these characters equally strong and energetic, even in the human species?

This friendship, however, is the same with that of a lady for her goldfinch, of a child for its toy, or a dog for its master. Both attachments are equally blind and void of reflection: That of animals is only more natural, because it arises from their wants; while that of the other is nothing but an insipid amusement, in which the mind has no share. These puerile attachments are kept alive by habit, and acquire all their strength from a vacancy of brain. A taste for whims, the worship of idols, and, in a word, an attachment to inanimated objects, indicate the highest degree of stupidity; and yet there are many makers and worshippers of idols; and many are fond of the soil which they have tilled.

All attachments, therefore, are acquired without the intervention of the mind; for they uniformly arise when we think least, and they acquire force, and become habitual, by want of reflection. If an object pleases our senses, we instantly

inſtantly love it; and, if this object continues for ſome time to occupy our attention, we convert it into an idol.

But friendſhip neceſſarily implies the power of reflection. It is of all attachments the moſt worthy of man, and the only one which degrades not his nature. Friendſhip is the offspring of reaſon. The impreſſions of ſenſe have no ſhare in its production. It is the mind of our friend that we love; and to love a mind, implies that we have one, and that we have employed it in the inveſtigation of knowledge, and in diſtinguiſhing the faculties of different minds. Friendſhip, therefore, ſuppoſes, not only the exiſtence of an intelligent principle, but the actual exertions of this principle in reflecting and reaſoning.

Thus, friendſhip belongs only to man; and though the brutes may be allowed to have attachments, ſentiment alone is ſufficient to attach them to thoſe whom they often ſee, and by whom they are fed and protected. It is ſtill more ſufficient to attach them to objects with which they are obliged to be much connected. The attachment of mothers to their young proceeds from their being long occupied in carrying them in the womb, and in producing and ſuckling them. In ſome ſpecies of birds, the fathers ſeem to have an attachment for their offspring, and to provide for the mothers during incubation: This attachment originates from their being employed in building the

the neſt, and from the pleaſure they receive from the females, which continue in ſeaſon long after impregnation. But, in the other animals, whoſe ſeaſon of love is ſhort, whenever it is paſt, the males have no attachment to the females. Where there is no neſt, no common operation to be performed, the fathers, like thoſe of Sparta, have no regard to their poſterity.

The pride and ambition of animals are effects of their natural courage, or of the ſentiments ariſing from their ſtrength, agility, &c. Large animals ſeem to deſpiſe the audacious inſults of the ſmaller ones. Their courage and ardour are even capable of being improved by education and example; for they are ſuſceptible of every thing, except reaſon. In general, brute animals can learn to repeat the ſame action a thouſand times, to perform in ſucceſſion what they only did by intervals, to continue an action a long time, which they were accuſtomed to finiſh in an inſtant, to do voluntarily what at firſt was the effect of force, to perform habitually what they once executed by chance, and to do, of their own accord, what they ſee performed by others. Of all the reſults of the animal machine, that of imitation is the moſt admirable. It is the moſt delicate as well as the moſt extenſive principle of action, and makes the neareſt approach to thought: And though, in animals, the cauſe of it be purely material, its effects have always been aſtoniſhing. Men never admired

the apes, till they saw them imitate human actions. It is not, indeed, an easy matter to distinguish some copies from the originals. There are, besides, so few who can clearly perceive the difference between genuine and counterfeit actions, that, to the bulk of mankind, the apes must always excite surprise and humiliation.

The apes, however, are more remarkable for talents than genius. Though they have the art of imitating human actions, they are still brutes, all of which, in various degrees, possess the talent of imitation. This talent, in most animals, is entirely limited to the actions of their own species. But the ape, although he belongs not to the human species, is capable of imitating some of our actions. This power, however, is entirely the effect of his organization. He imitates the actions of man, because his structure has a gross resemblance to the human figure. What originates solely from organization and structure, is thus ignorantly ascribed, by the vulgar, to intelligence and genius.

By the relations of motion, a dog learns the habit of his master; by the relations of figure, an ape mimics human gestures; and, by the relations of organization, a goldfinch repeats musical airs, and a parrot imitates speech, which forms the greatest external difference between one man and another, and between man and the other animals; for, by means of language, one man discovers a superiority of knowledge and genius,

genius, while others exprefs by it nothing but confufed or borrowed ideas; and, in an ideot, or in a parrot, it ferves only to mark the laft degree of ftupidity; the incapacity, in either, to produce thought or reflection, though both be endowed with proper organs for expreffing what paffes within them.

It is ftill eafier to prove that imitation is a refult of mere mechanifm. The moft perfect imitation depends on the vivacity with which the internal material fenfe receives the impreffions of objects, and the facility of expreffing them by the aptnefs of external organs. Men whofe fenfes are moft delicate and eafily affected, and whofe members are moft agile and flexible, make the beft actors, the beft mimics, the beft monkeys. Children, infenfibly, and without reflection, imitate the actions, the geftures, and the manners of thofe with whom they live: They are extremely alert in repeating and counterfeiting. Moft young people, though they fee with the eyes of the body only, are very dexterous in perceiving ridiculous figures. They are ftruck with every ftrange form or new reprefentation. The impreffion is fo ftrong that they relate it with enthufiafm, and copy it with eafe and with gracefulnefs. Children, therefore, poffefs, in a fuperior degree, the talent of imitation, which fuppofes more perfect organs and a more happy difpofition of members, to which nothing is fo repugnant as a large portion of good fenfe.

Thus,

Thus, among men, those who reflect least, have generally the strongest imitative talents. It is not, therefore, surprising, that this talent should appear in those animals who have no reflection. They ought even to possess it in the highest degree of perfection, because they have nothing to oppose its operation, no principle to excite a desire of differing from each other. Among men, all the diversity of character, and variety of action, proceed entirely from the mind. But brute animals, who have no mind, and consequently are destitute of that principle which can alone give rise to variety of character, or of personal accomplishments, must, when they resemble each other in organization, or are of the same species, do the same things in the same manner, and imitate one another more perfectly than one man can imitate the actions of another man. Of course, the talent of imitation possessed by the brute animals, so far from implying thought or reflection, proves that they are absolutely deprived of both.

It is, for the same reason, that the education of animals, though short, is always successful. They soon acquire, by imitation, all the knowledge of their parents. They not only derive experience from their own feelings, but, by means of imitation, they learn the experience acquired by others. Young animals model themselves entirely upon the old: They see the latter approach or fly, when they perceive particular objects,

objects, hear certain ſounds, or ſmell certain odours. At firſt, they approach or fly without any other determining principle but that of imitation; and afterwards they approach or fly of their own accord, becauſe they have then acquired the habit of flying or approaching, whenever they feel the ſame ſenſations.

Having thus compared man with the brutes, when taken individually, I ſhall now compare man in ſociety with the gregarious tribes, and endeavour to inveſtigate the cauſe of that ſpecies of induſtry which is ſo remarkable in ſome animals, even of the loweſt and moſt numerous orders. What marvellous feats are not daily aſcribed to certain inſects? The talents and wiſdom of the bee are admired with envy: They are ſaid to poſſeſs an art peculiar to themſelves, the art of perfect government. A bee-hive, ſay the eulogiſts of this inſect, is a republic where every individual labours for the community, where every thing is diſtributed and arranged with a foreſight, an equity, and a prudence, that is truly aſtoniſhing: The policy of Athens itſelf was not more perfect, or better conducted: The more we examine theſe inſects, they exhibit freſh objects of admiration; an unalterable and uniform ſyſtem of government, a profound reſpect for the ſovereign, an anxious attention to his welfare and inclinations, an ardent love to their country, an incredible aſſiduity in labouring for the public good, the greateſt diſintereſtedneſs,

joined

joined to the strictest œconomy, the finest geometry, combined with the most elegant architecture, &c. But, were I to run over the annals of this republic, and to retail all the incidents in the œconomy of these insects, which have excited the admiration of their historians, I should never come to an end.

Independent of that attachment which men acquire for their favourite subjects, the more they observe, and the less they reason, their admiration is proportionally augmented. Can any thing be more gratuitous than this blind admiration of bees, than the pure republican principles ascribed to them, than that singular instinct which rivals the most sublime geometry, which solves, without hesitation, the difficult problem of *building, in the most solid manner, in the least possible space, and with the greatest possible œconomy?* These eulogies are not only excessive, but ridiculous. A bee ought to hold no higher rank in the estimation of a naturalist, than it actually holds in nature. This wonderful republic, therefore, must always appear, in the eye of reason, to be only an assemblage of small animals, which have no other relation to man, but that of furnishing him with wax and honey.

I here blame not curiosity, but absurd exclamation, and false reasoning. To examine the operations of bees, to observe the progress of their labours, to describe their generation, their metamorphoses, &c. these are objects worthy the

attention

attention of philoſophers. But it is the morality, and even the theology aſcribed to inſects, that I cannot hear with patience: It is the marvellous feats firſt invented, and then extolled by naturaliſts, which I wiſh to examine: It is the intelligence, the foreſight, and even the knowledge of futurity, which have, with ſo much exaggeration, been falſely laviſhed upon them, that I muſt endeavour to reduce to their juſt value.

The genius of ſolitary bees, it is allowed on all hands, is vaſtly inferior to that of the gregarious ſpecies; and the talents of thoſe which aſſociate in ſmall troops, are leſs conſpicuous than of thoſe that aſſemble in numerous bodies. Is not this alone ſufficient to convince us, that the ſeeming genius of bees is nothing but a reſult of pure mechaniſm, a combination of movements proportioned to numbers, an effect which appears to be complicated, only becauſe it depends on thouſands of individuals? Has not every congruity, and even diſorder itſelf, the appearance of harmony when we are ignorant of the cauſe? From apparent order to actual intelligence, there is but one ſtep; for men are always more diſpoſed to admire, than to reaſon.

It muſt, therefore, be admitted, that bees, taken ſeparately, have leſs genius than the dog, the monkey, and moſt other animals: It will likewiſe be admitted, that they have leſs docility, leſs attachment, and leſs ſentiment; and that they poſſeſs fewer qualities relative to thoſe of

the human ſpecies. Hence we ought to acknowledge, that their apparent intelligence proceeds ſolely from the multitude united. This union, however, preſuppoſes not intellectual powers; for they unite not from moral views: They find themſelves aſſembled together without their conſent. This ſociety, therefore, is a phyſical aſſemblage ordained by Nature, and has no dependence on knowledge or reaſoning. The mother bee produces at one time, and in the ſame place, ten thouſand individuals, which, though they were much more ſtupid than I have ſuppoſed them, would be obliged, ſolely for the preſervation of their exiſtence, to arrange themſelves into ſome order. As they all act againſt each other with equal forces, ſuppoſing their firſt movements to produce pain, they would ſoon learn to diminiſh this pain, or, in other words, to afford mutual aſſiſtance: They, of courſe, would exhibit an air of intelligence, and of concurring in the accompliſhment of the ſame end. A ſuperficial obſerver would inſtantly aſcribe to them views and talents which they by no means poſſeſs: He would explain every action: Every operation would have its particular motive, and prodigies of reaſon would ariſe without number; for ten thouſand individuals, produced at one time, and obliged to live together, muſt all act in the very ſame manner; and, if endowed with feeling, they muſt acquire the ſame habits, aſſume that arrangement which is leaſt painful

or moſt eaſy to themſelves, labour in their hive, return after leaving it, &c. Hence the origin of the many wonderful talents aſcribed to bees, ſuch as their architecture, their geometry, their order, their foreſight, their patriotiſm, and, in a word, their republic, the whole of which, as I have proved, has no exiſtence but in the imagination of the obſerver.

Is not Nature herſelf ſufficiently aſtoniſhing, without aſcribing to her miracles of our own creation? Are not the works of the Almighty ſufficient to demonſtrate his power? And do we imagine that we can enhance it by our weakneſs? If poſſible, this is the very way to degrade his perfections. Who gives the grandeſt idea of the ſupreme Being; he who ſees him create the univerſe, arrange every exiſtence, and found Nature upon invariable and perpetual laws; or he who inquires after him, and diſcovers him conducting and ſuperintending a republic of bees, and deeply engaged about the manner of folding the wings of a beetle?

Some animals unite in ſocieties, which ſeem to depend on the choice of thoſe that compoſe them, and, conſequently, make a nearer approach to intelligence and deſign than that of the bees, which has no other principle than phyſical neceſſity. The elephants, the beavers, the monkeys, and ſeveral other ſpecies of animals, aſſemble in troops, for defending each other, and for the purpoſe of carrying on ſome common operations.

If

If theſe ſocieties were leſs diſturbed, and, if they could be obſerved with equal eaſe as that of the bees, we ſhould doubtleſs diſcover wonders of a very different nature, which, notwithſtanding, would be only effects of phyſical laws. When a multitude of animals of the ſame ſpecies are aſſembled in one place, a particular arrangement, a certain order, and common habits, muſt be the neceſſary reſults *. Now, every common habit, ſo far from having intelligence for its cauſe, implies nothing more than a blind imitation.

Society, among men, depends leſs upon phyſical than moral relations. His weakneſs, his wants, his ignorance, and his curioſity, ſoon taught him the neceſſity of aſſociating: He ſoon found that ſolitude was a ſtate of war and of danger; and he ſought for ſafety, peace, and ſociety. He augmented his own power and his knowledge, by uniting them with thoſe of his fellow-creatures. This union was the beſt uſe he ever made of his rational faculties. Man commands the univerſe ſolely becauſe he has learned to govern himſelf, and to ſubmit to the laws of ſociety.

Every thing has concurred to render man a ſocial animal: Though large and poliſhed ſocieties certainly depend upon cuſtom, and ſometimes on the abuſe of reaſon, they were unqueſtionably preceded by ſmaller aſſociations, which had no baſis but that of Nature. A family is a

* See the hiſtory of the deer, rabbit, &c.

natural

natural society, which has deeper and more permanent foundations, because it is accompanied with more wants, and more causes of attachment. Man differs from the other animals: When he comes into the world, he hardly exists. Naked, feeble, and incapable of action, his life depends on the aid of others. The weaknesses of infancy continue long. The necessity of support is converted into a habit, which, of itself, is capable of producing a mutual attachment between the child and its parents. But, as the child advances, he gradually acquires more force, and has less need of assistance. The affection of the parents, on the contrary, continues, while that of the child grows daily less. Thus love descends more than it ascends. The attachment of the parent becomes excessive, blind, and invincible; and that of the child remains cold and inactive, till the seeds of gratitude are unfolded by reason.

Thus human society, even when confined to a single family, implies the existence of the rational faculty; that of gregarious animals, who seem to unite from choice and convenience, implies experience and sentiment; and that of insects, which, like the bees, are associated without design or motive, implies nothing at all. Whatever may be the effects of this latter association, it is clear, that they have neither been foreseen nor conceived by the creatures which produced them, and that they result solely from

universal laws of mechanism established by the Almighty. Suppose ten thousand automatons assembled in the same place, all endowed with the same force, and determined, by a perfect resemblance in their external and internal structure, and by a uniformity in their movements, to perform the same operation, a regular work would be the necessary result. They would exhibit the relations of regularity, of resemblance, and of position; because these depend upon the relations of motion, which we have supposed to be equal and uniform. The relations of juxta-position, of extension, and of figure, would also appear; because we have supposed a given and circumscribed place: And, if we bestow on these automatons the smallest degree of sensation, just as much as is necessary to make them feel their existence, to have a tendency to self-preservation, to avoid what is hurtful, to desire what is agreeable, &c. their operations will be not only regular, proportioned, similar, and equal, but they will have the air of the highest symmetry, solidity, convenience, &c.; because, in the process of their labours, each of the ten thousand individuals has assumed that arrangement which was most commodious to itself, and has, at the same time, been obliged to act, and to arrange itself in the manner least incommodious to the rest.

Shall I enforce this argument still farther? The hexagonal cells of the bee, which have been

the ſubject of ſo much admiration, furniſh an additional proof of the ſtupidity of theſe inſects: This figure, though extremely regular, is nothing but a mechanical reſult, which is often exhibited in ſome of the moſt rude productions of Nature. Cryſtals, and ſeveral other ſtones, as well as particular ſalts, &c. conſtantly aſſume this figure. The ſmall ſcales in the ſkin of the rouſſette, or great Ternate bat, are hexagonal, becauſe each ſcale, when growing, obſtructs the progreſs of its neighbour, and tends to occupy as much ſpace as poſſible. We likewiſe find theſe ſame hexagons in the ſecond ſtomach of ruminating animals, in certain ſeeds, capſules, and flowers, &c. If we fill a veſſel with cylindrical grain, and, after filling up the interſtices with water, ſhut it cloſe up, and boil the water; all theſe cylinders will become hexagonal columns. The reaſon is obvious, and purely mechanical. Each cylindrical grain tends, by its ſwelling, to occupy as much ſpace as poſſible; and, therefore, by reciprocal compreſſion, they neceſſarily aſſume an hexagonal figure. In the ſame manner, each bee endeavours to occupy as much ſpace as poſſible, in the limited dimenſions of the hive; and, therefore, as the bodies of the bees are cylindrical, they muſt neceſſarily make their cells hexagonal, from the reciprocal obſtruction they give to each other.

The genius of bees has been eſtimated according to the regularity of their works. Bees are

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ſaid to be more ingenious than waſps, hornets, &c.; for, though the latter are acquainted with architecture, their fabrics are more rude and irregular. But it was not conſidered by the abettors of this opinion, that the greater or leſs regularity depends ſolely on the number and figure, and not on the intelligence of theſe creatures. In proportion to the greatneſs of the number, there are more equal and oppoſite forces in action, and, of courſe, more mechanical reſtraint, and more regularity and apparent perfection in their works.

Thoſe animals, therefore, who moſt reſemble man in figure and organization, notwithſtanding the eulogiſts of inſects, will ſtill remain ſuperior to all others in their internal qualities: And, though theſe qualities be infinitely different from thoſe of man, though they are, as has been proved, the reſults of experience and feeling only; yet they greatly exceed the qualities of inſects. As every operation of Nature is conducted by ſhades, or ſlight gradations, a ſcale may be formed for aſcertaining the intrinſic qualities of every animal, by taking, for the firſt point, the material part of man, and by placing the animals ſucceſſively at different diſtances, in porportion as they approach or recede from that point, either in external form, or internal organization. Agreeable to this ſcale, the monkey, the dog, the elephant, and other quadrupeds, will hold the firſt rank: the cetaceous animals,

who,

who, like the quadrupeds, consist of flesh and blood, and are viviparous, will hold the second; the birds the third, because they differ more from man than the quadrupeds or cetaceous animals; and, were it not for oysters and polypi, which seem to be the farthest removed from man, the insects would be thrown into the lowest rank of animated beings.

But, if the animals be deprived of understanding, of genius, of memory, and of all intelligence; if their faculties depend on their senses, and be limited entirely to the exercise of experience and of feeling, how can we account for that species of foresight which some of them seem to possess? Could feelings alone determine them to amass provisions in summer to nourish them during the rigours of winter? Does not this imply a comparison of time, a rational anxiety concerning their future comfort and subsistence? Why do birds build nests, if they know not that they will be useful for depositing their eggs and rearing their young? It is unnecessary to multiply facts of the same nature.

Before solving these questions, or reasoning concerning the above and similar facts, it is necessary to ascertain their reality: Instead of being retailed by lovers of the marvellous, if they had been examined by men of sense, and collected by philosophers, I am persuaded, that all these pretended miracles would have soon disappeared, and that, by cool and dispassionate reflection, the

cauſe of each particular fact might have been diſcovered. But let us admit the truth of all theſe facts; let us allow to the animals foreſight, and even a knowledge of the future, can this be aſcribed to their intellectual powers? If this were really the caſe, their intelligence would be greatly ſuperior to ours; For our foreſight is entirely conjectural; our notions concerning futurity are always doubtful, and founded on probabilities. Hence brute animals, who ſee the future with certainty, ſince they determine before hand, and are never deceived, would be endowed with a principle of knowledge ſuperior to the human mind. I aſk, whether this concluſion be not equally repugnant to religion and to reaſon?

It is impoſſible, therefore, that the brutes have a certain knowledge of the future from an intellectual principle ſimilar to ours. Why, then, aſcribe to them, upon ſuch ſlight grounds, a quality ſo ſublime? Why unneceſſarily degrade the human ſpecies? Is it not leſs unreaſonable to refer the cauſe to mechanical laws, eſtabliſhed, like the other laws of Nature, by the will of the Creator? The certainty with which animals are ſuppoſed to act, and the ſtability and uniformity of their determinations, ſufficiently evince them to be the effects of pure mechaniſm. To doubt, to deliberate, to compare, are the eſſential characters of reaſon. But movements and actions which are always deciſive, and always certain,

indicate, at the same time, both mechanism and stupidity.

But, as the laws of Nature are general effects only, and, as the facts in question are limited and particular, it would be less philosophic, and more unworthy of the ideas we ought to entertain of the Creator, to embarrass his will thus gratuitously with a vast number of petty statutes, of which one must be enacted for bees, another for owls, a third for field-mice, &c. Should we not, on the contrary, exert all our efforts to reduce these particular effects to more general ones? And, if that be impossible, let us record them, and wait patiently till new facts and new analogies enable us to investigate their causes.

Let us, however, examine if these facts be so inexplicable and so marvellous, or even if they be properly authenticated. The foresight ascribed to ants is now discovered to be a vulgar error. They remain in a torpid state during winter. Their provisions, therefore, are only a superfluous mass, collected without design, and without any knowledge of the future; for, on the supposition of this knowledge, they would be endowed with the faculty of foreseeing what was perfectly useless. Is it not natural for animals that have a fixed abode, to which they are accustomed to transport their provisions, to collect more than they can consume? Is not feeling alone, guided by the habit they have acquired of transporting their food, in order that they

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may uſe it in tranquillity, ſufficient to account for this phænomenon? Does not this demonſtrate that they are only endowed with feeling, and not with reaſon? For the ſame reaſon, bees collect more wax and honey than they can conſume: Man profits not, therefore, by their intelligence, but by their ſtupidity. Intelligence would neceſſarily determine them to collect no more than they could uſe, and to ſave themſelves the trouble of amaſſing a ſuperfluous quantity, eſpecially after they learn, from experience, that this labour is loſt, that the overplus is uniformly taken from them, and that this abundance is the ſole cauſe of the deſolation and deſtruction of their ſociety. What demonſtrates this ſuperfluous labour to be the effect of feeling alone is, that we can oblige them to work as much as we pleaſe. As long as there are flowers in any country, the bee continues to extract from them honey and wax. If bees were tranſported from one region to another, ſo as to afford them a conſtant ſucceſſion of freſh flowers, their labours would never ceaſe. The amaſſing diſpoſition of the bee, therefore, is not an effect of foreſight, but a movement produced by feeling; and this movement is continued as long as the objects which give riſe to it exiſt.

I have beſtowed particular attention on the œconomy of field-mice. Their holes are generally divided into two apartments; in one of them they depoſit their young, and, in the other,

other, every thing that is agreeable to their palates. When made by themselves, their holes are not large, and can receive a small quantity of provisions only: But, when they find a large space under the trunk of a tree, there they take up their abode, and fill it with all the grain, nuts, &c. they can collect. Hence the quantity of provisions amassed, instead of being proportioned to the wants of the animal, depend entirely on the capacity of the place where they happen to be deposited.

Thus the provisions of the ant, of the field-mouse, and of the bee, are discovered to be only useless and disproportioned masses, collected without any view to futurity, and the minute and particular laws of their pretended foresight are reduced to the general and real law of feeling. The sagacity and foresight ascribed to birds originate from the same cause. To account for the construction of their nests, it is unnecessary to have recourse to a particular law established by the Almighty in their favour. To this operation they are led by degrees. They first find a proper place, and then bring materials to render it more commodious. The nest is only a place which they can distinguish from all others, and where they can live in tranquillity. Love is the sentiment that stimulates and directs them in this operation. The male and female require the aid of each other. They feel a strong mutual attachment; they endeavour to conceal themselves,

themselves, and to retire from the rest of the world, which is now become more dangerous to them than ever. They, therefore, retreat to the forest, to places the most obscure and inaccessible; and, to render their situation more comfortable, they collect straw, leaves, &c. and form them, with incessant labour, into a common habitation. Some, less dexterous or less sensual, make coarse and rude nests; others, contented with what they find already made, have no other habitation than the holes they meet with, or the nests which are presented to them. All these operations are effects of organization, and depend upon feeling, which, however exquisite in degree, can never produce reasoning; and still less can it produce that intuitive foresight, that certain knowledge of futurity, which have been ascribed to the feathered tribes.

This doctrine may be farther proved by a few familiar examples. Birds, instead of knowing the future, are even ignorant of what is past. A hen cannot distinguish her own eggs from those of another bird. She perceives not that the young ducks whom she has hatched belong not to her. She broods over chalk eggs, from which nothing can be produced, with equal industry as if they were her own. She has no knowledge, therefore, either of the past or the future, and is still more deceived with regard to the present. Why do not domestic poultry make nests as well as other birds? Is it because

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the male belongs to many females? or rather, is it not becaufe, being accuftomed to be out of the reach of inconvenience and danger, they have no occafion to conceal themfelves, no habit of feeking for fafety in retreat and folitude? This admits of proof by facts; for wild birds of the fame fpecies perform actions which are entirely neglected when in a domeftic ftate. The wild duck and wood-hen build nefts; but none are made by thefe birds when in a domeftic ftate. The nefts of birds, therefore, the cells of bees, the collections of food laid up by the ant, the field-moufe, &c. fuppofe not any intelligence in thofe animals, nor proceed from particular laws eftablifhed for each fpecies, but depend, like every other animal operation, on number, figure, motion, organization, and feeling, which are general laws of Nature, and common to all animated beings.

It is by no means aftonifhing that man, who is fo little acquainted with himfelf, who fo often confounds his fenfations and ideas, who fo feldom diftinguifhes the productions of the mind from thofe of the brain, fhould compare himfelf to the brute animals, and make the only difference between them confift in the greater or lefs perfection of their organs: It is not furprifing that he fhould make them reafon, underftand, and determine in the fame manner with himfelf; and that he fhould attribute to them not only thofe qualities which he poffeffes, but even thofe

of which he is deprived. Let man, however, examine, analyse, and contemplate himself, and he will soon discover the dignity of his being; he will perceive the existence of his soul; he will cease to degrade his nature; he will see, at one glance, the infinite distance placed by the Supreme Being between him and the brutes.

God alone knows the past, the present, and the future. Man, whose existence continues but a few moments, perceives only these moments: But a living and immortal power compares these moments, distinguishes and arranges them. It is by this power that man knows the present, judges of the past, and foresees the future. Deprive him of this divine light, and you deface and obscure his being; nothing will remain but an animal equally ignorant of the past and the future, and affectable only by present objects.

OF DOMESTIC ANIMALS.

MAN changes the natural condition of animals, by forcing them to obey and to serve him. A domestic animal is a slave destined to the amusement, or to aid the operations of men. The abuses to which he is too frequently subjected, joined to the unnatural mode of his living, induce great alterations both in his manners and dispositions. But a savage animal, obedient to Nature alone, knows no laws but those of appetite and independence. Thus the history of savage animals is limited to a small number of facts, the results of pure Nature. But the history of domestic animals is complicated, and warped with every thing relative to the arts employed in taming and subduing the native wildness of their tempers: And, as we are ignorant what influence habit, restraint, and example, may have in changing the manners, determinations, movements, and inclinations of animals, it is the duty of the naturalist to examine them with care, and to distinguish those facts which depend solely on instinct, from those that originate from education; to ascertain what is proper to them from what is borrowed; to separate artifice from Nature; and never to con-

found the animal with the ſlave, the beaſt of burden with the creature of God.

Man holds a legitimate dominion over the brute animals, which no revolution can deſtroy. It is the dominion of mind over matter; a right of Nature founded upon unalterable laws, a gift of the Almighty, by which man is enabled at all times to perceive the dignity of his being: For his power is not derived from his being the moſt perfect, the ſtrongeſt, or the moſt dexterous of all animals. If he hold only the firſt rank in the order of animals, the inferior tribes would unite, and diſpute his title to ſovereignty. But man reigns and commands from the ſuperiority of his nature: He thinks; and therefore he is maſter of all beings who are not endowed with this ineſtimable talent. Material bodies are likewiſe ſubject to his power: To his will they can oppoſe only a groſs reſiſtance, or an obſtinate inflexibility, which his hand is always able to overcome, by making them act againſt each other. He is maſter of the vegetable tribes, which, by his induſtry, he can, at pleaſure, augment or diminiſh, multiply or deſtroy. He reigns over the animal creation; becauſe, like them, he is not only endowed with ſentiment and the power of motion, but becauſe he thinks, diſtinguiſhes ends and means, directs his actions, concerts his operations, overcomes force by ingenuity, and ſwiftneſs by perſeverance.

Among animals, however, some are more soft and gentle, others more savage and ferocious. When we compare the docility and submissive temper of the dog with the fierceness and rapacity of the tiger, the one appears to be the friend, and the other the enemy of man. Thus his empire over the animals is not absolute. Many species elude his power, by the rapidity of their flight, by the swiftness of their course, by the obscurity of their retreats, by the element which they inhabit: Others escape him by the minuteness of their bodies; and others, instead of acknowledging their sovereign, attack him with open hostility. He is likewise insulted with the stings of insects, and the poisonous bites of serpents; and he is often incommoded with impure and useless creatures, which seem to exist for no other purpose but to form the shade between good and evil, and to make man feel how little, since his fall, he is respected.

But the empire of God must be distinguished from the limited dominion of man. God, the creator of all being, is the sole governor of Nature. Man has no influence on the universe, the motions of the heavenly bodies, or the revolutions of the globe which he inhabits. He has no general dominion over animals, vegetables, or minerals. His power extends not to species, but is limited to individuals; for species and the great body of matter belong to, or rather constitute Nature. Every thing moves on, perishes,

or

or is renewed, by an irresistible power. Man himself, hurried along by the torrent of time, cannot prolong his existence. Connected, by means of his body, to matter, he is forced to submit to the universal law, and, like all other organized beings, he is born, grows, and perishes.

But the ray of divinity with which man is animated, ennobles and animates him above every material existence. This spiritual substance, so far from being subject to matter, is entitled to govern it; and though the mind cannot command the whole of Nature, she rules over individual beings. God, the source of all light and of all intelligence, governs the universe, and every species, with infinite power: Man, who possesses only a ray of this intelligence, enjoys, accordingly, a power limited to individuals, and to small portions of matter.

It is, therefore, apparent, that man has been enabled to subdue the animal creation, not by force, or the other qualities of matter, but by the powers of his mind. In the first ages of the world, all animals were equally independent. Man, after he became criminal and savage, was not in a condition to tame them. Before he could distinguish, choice, and reduce animals to a domestic state, before he could instruct and command them, he behoved to be civilized himself; and the empire over the animals, like all other empires, could not be established previous to the institution of society.

Man

Man derives all his power from ſociety, which matures his reaſon, exerciſes his genius, and unites his force. Before the formation of ſociety, man was perhaps the moſt ſavage and the leaſt formidable of all animals. Naked, without ſhelter, and deſtitute of arms, the earth was to him only a vaſt deſert peopled with monſters, of which he often became the prey: And, even long after this period, hiſtory informs us, that the firſt heroes were only deſtroyers of wild beaſts.

But, when the human ſpecies multiplied and ſpread over the earth, and when, by means of ſociety and the arts, man was enabled to conquer the univerſe, he made the wild beaſts gradually retire; he purged the earth of thoſe gigantic animals, whoſe enormous bones are ſtill to be found; he deſtroyed, or reduced to a ſmall number, the voracious and hurtful ſpecies; he oppoſed one animal to another; and, ſubduing ſome by addreſs, and others by force, and attacking all by reaſon and art, he acquired to himſelf perfect ſecurity, and eſtabliſhed an empire, which knows no other limits than inacceſſible ſolitudes, burning ſands, frozen mountains, or dark caverns, which ſerve as retreats to a few ſpecies of ferocious animals.

THE

HORSE*.

THE reduction of the horse to a domestic state, is the greatest acquisition from the animal world, which was ever made by the art and industry of man. This noble animal partakes of the fatigues of war, and seems to feel the glory of victory. Equally intrepid as his master, he encounters danger and death with ardour and with magnanimity. He delights in the noise and tumult of arms, and annoys the enemy with resolution and alacrity. But it is not in perils and conflicts alone that the horse willingly co-operates with his master; he likewise participates of human pleasures. He exults in the chace and the tournament; his eyes sparkle with emulation in the course. But, though bold and intrepid, he suffers not himself to be carried off by a furious ardour; he represses his movements, and knows how to govern and check the natu-

* *Equus caballus*, cauda undique setosa; *Linn. Syst. Nat.* p. 100.

Horse—Hoof consisting of one piece; six cutting teeth in each jaw; *Pennant, Synops. of Quadrup.* p. 1.

ral vivacity and fire of his temper. He not only yields to the hand, but seems to consult the inclination of his rider. Uniformly obedient to the impressions he receives, he flies or stops, and regulates his motions entirely by the will of his master. He, in some measure, renounces his very existence to the pleasure of man. He delivers up his whole powers; he reserves nothing, and often dies rather than disobey the mandates of his governor.

These are features in the character of the horse, whose natural qualities have been matured by art, and turned with care to the service of man. His education commences with the loss of liberty, and is completed by restraint. The slavery of the horse is so ancient and so universal, that he is rarely seen in a natural state. When employed in labour, he is always covered with the harness; and, even during the time destined for repose, he is never entirely delivered from bonds. If sometimes permitted to roam in the pasture, he always bears the marks of servitude, and often the external impressions of labour and pain. His mouth is deformed by the perpetual friction of the bit; his sides are galled with wounds, or furrowed with cicatrices; and his hoofs are pierced with nails. The natural gestures of his body are constrained by the habitual pressure of fetters, from which it would be in vain to deliver him; for he would not be more at liberty. Those horses, the servitude of which is most

 mild,

mild, which are kept ſolely for the purpoſes of luxury and magnificence, and whoſe golden chains only gratify the vanity of their maſters, are more diſhonoured by the elegance of their trappings, and by the plaits of their hair, than by the iron ſhoes on their feet.

Art is always excelled by Nature; and, in animated beings, liberty of movement conſtitutes the perfection of their exiſtence. Examine thoſe horſes which have multiplied ſo prodigiouſly in Spaniſh America, and live in perfect freedom. Their motions are neither conſtrained nor meaſured. Proud of their independence, they fly from the preſence of man, and diſdain all his care. They ſearch for, and procure the food that is moſt ſalutary and agreeable. They wander and friſk about in immenſe meadows, and collect the freſh productions of a perpetual ſpring. Without any fixed habitation, or other ſhelter than a ſerene ſky, they breathe a purer air than in thoſe muſty vaults in which we confine them, when ſubjected to our dominion. Hence wild horſes are ſtronger, lighter, and more nervous than moſt of thoſe which are in a domeſtic ſtate. The former poſſeſs force and dignity, which are the gifts of Nature; the latter have only addreſs and gracefulneſs, which are all that art can beſtow.

Theſe wild horſes are by no means ferocious in their temper; they are only wild and fiery. Though of ſtrength ſuperior to moſt animals,

mals, they never make an attack. But, when aſſaulted, they either diſdain the enemy, bounce out of his way, or ſtrike him dead with their heels. They aſſociate in troops from no other motive than the pleaſure of being together; for they have no fear; but acquire a mutual attachment to each other. As graſs and vegetables conſtitute their food, of which they have enough to ſatisfy their appetite, and, as they are not carnivorous, they neither make war with other animals, nor among themſelves. They diſpute not about their common nouriſhment, and never have occaſion to ſnatch prey from each other, the general ſource of quarrels and combats among the rapacious tribes. Hence they live in perpetual peace; becauſe their appetites are ſimple and moderate, and they have no objects to excite envy.

All theſe features are apparent in young horſes bred together in troops. Their manners are gentle, and their tempers ſocial; their force and ardour are generally rendered conſpicuous by marks of emulation. They anxiouſly preſs to be foremoſt in the courſe, to brave danger in traverſing a river, or in leaping a ditch or precipice; and it has been remarked, that thoſe which are moſt adventurous and expert in theſe natural exerciſes, are the moſt generous, mild, and tractable, when reduced to a domeſtic ſtate.

Wild horſes are mentioned by ſeveral ancient authors. Herodotus takes notice of white

ſavage horſes on the banks of the Hypanis in Scythia; and, in the northern part of Thrace, beyond the Danube, he remarks, that there were wild horſes, covered all over with hair, five inches long. Ariſtotle ſays, they were to be found in Syria; Pliny, in the northern regions; and Strabo, in Spain and the Alps. Among the moderns, Cardan ſays the ſame thing of Scotland, and the Orkney iſles *; Olaus, of Muſcovy; Dapper, of the iſland of Cyprus, where, he ſays, there were beautiful wild horſes, of great ſtrength and ſwiftneſs †; and Struys, of the iſland of May, one of the Cape de Verds, where he ſaw wild horſes of a ſmall ſtature ‡. Leo of Africa likewiſe relates, that there were wild horſes in the deſerts of Africa and Arabia; and he aſſures us, that he ſaw, in the ſolitudes of Numidia, a colt with criſped hair, and a criſped mane ‖. Marmol confirms this fact, by informing us, that ſmall wild horſes, ſome of them of an aſh-colour, and others white, with ſhort curled hair and manes, are to be found in the Lybian and Arabian deſerts §: He adds, that they outrun the dogs and domeſtic horſes. We likewiſe learn, from the Lettres Edifiantes **, that there are ſmall wild horſes in China.

* Aldrovand. de Quadrup. Soliped. lib. i. p. 19.
† See a Deſcript. des Iſles de l'Archipel. p. 50.
‡ Voyages de Struys, tom. i. p. 11.
‖ Deſcript. Africæ, part ii. vol. ii. p. 750.
§ L'Afrique de Marmol, tom. i. p. 50.
** Lettres Edifiantes, recueil x. vi. p. 371.

But, as Europe is now almoſt equally peopled, wild horſes are no where to be found in this quarter of the globe. Thoſe in America are the offspring of domeſtic horſes, tranſported originally from Europe by the Spaniards. In theſe uninhabited, or rather depopulated regions, horſes have multiplied prodigiouſly. That this ſpecies of animal was unknown in the New World, appears from the terror and aſtoniſhment expreſſed by the Mexicans and Peruvians at the ſight of horſes and their riders. The Spaniards carried great numbers of horſes to theſe regions, both with a view to their ſervice, and to the propagation of the breed. Many, accordingly, were left on the iſlands, as well as on the Continent, where they have multiplied like other wild animals. M. de Salle *, in the year 1685, ſaw, near the bay of St. Louis in North America, theſe horſes grazing in the meadows; and they were ſo wild that he could not approach them. The author of the hiſtory of the Buccaniers † remarks, 'That troops of 'horſes, to the number of 500, are ſometimes 'ſeen in the iſland of St. Domingo, who all run 'together; that, when they perceive a man, they 'all ſtop; and that one of them approaches to 'a certain diſtance, blows through his noſtrils, 'takes flight, and is inſtantly followed by the

* See les Dernieres Decouvertes dans l'Amer. ſepten. de M. de Salle, p. 250.

† L'Hiſt. des Avantur. Flibuſtiers, tom. i. p. 110.

 'whole

'whole troop.' He adds, that he is uncertain whether these horses have degenerated by becoming wild; but that he found none of them so handsome as those of Spain, though they sprung from the same race. 'They have,' he continues, 'very gross heads and limbs, and long 'necks and ears. The inhabitants tame them 'with ease, and then train them to labour. In 'taking them, gins of ropes are laid in the 'places where they frequent. When caught by 'the neck, they soon strangle themselves, unless 'some person arrives to disentangle them. They 'are tied to trees by the body and limbs, where 'they are left for two days without victuals or 'drink. This trial is generally sufficient for 'rendering them more tractable, and they soon 'become as gentle as if they had never been 'wild; and, even if they should by accident 'regain their liberty, they never resume their 'savage state, but know their masters, and allow 'themselves to be approached, and retaken with 'ease *.'

These

* M. Garsault mentions another method of taming wild horses. 'When the colts,' he observes, 'are not very early 'tamed, it sometimes happens, that the approach of man 'strikes them with terror; that they defend themselves with 'their heels and teeth, in such a manner, that it is almost 'impossible to dress or shoe them: if not broke by gentleness 'and patience, they are prevented from sleeping till they fall 'down with weakness. During this operation, a man con-'tinues, day and night, at their heads, giving them, from

'time

These facts prove horses to be naturally of gentle dispositions, and much disposed to associate with man. They never forsake the abodes of men, to regain their liberty in the forests. They discover, on the contrary, great anxiety to return to the stable, where they find only coarse food, which is always the same, and often measured to them more by the rules of œconomy, than by the strength of their appetite. But the sweets of habit supply all they have lost by slavery. After being oppressed with fatigue, the place of repose is full of delight. They smell it at a distance, can distinguish it in the midst of great cities, and seem uniformly to prefer bondage to liberty. They form a second nature out of those habits to which they have been forced to submit; for horses, after being abandoned in the forests, have been known to neigh continually, in order to be heard, to run to the voice of man, and even to grow meagre, and die in a short time, though surrounded with a profusion of nourishment.

Thus, it is obvious, the manners of a horse originate entirely from his education, which is accomplished by a care and industry bestowed by man upon no other animal; but he is amply rewarded by the perpetual services of this noble and laborious creature.

'time to time, handfuls of hay. When treated in this man-'ner, it is astonishing how soon their tempers are softened. 'Some horses, however, require to be kept awake for eight 'days.' See Nouveau parfait Maréchal, p. 89.

The

The foals are ſeparated from their mothers at the age of five, ſix, or at moſt ſeven months; for experience ſhows, that, when allowed to ſuck ten or eleven months, though generally fatter and larger, they are not of equal value as thoſe which have been more early weaned. After ſix or ſeven months, the foals are removed from their mothers, and are fed twice a-day with bran and a little hay, the quantity of which is augmented in proportion as they advance in age. They are confined to the ſtables as long as they diſcover any anxiety to return to their mothers. But when this inquietude is gone, they are allowed to go out, and are conducted to the paſture: They muſt not, however, be permitted to graze when their ſtomach is empty. An hour before being put to the graſs, they ſhould have a little bran, be made to drink, and ſhould never be expoſed to great colds or to rain. In this manner they paſs the firſt winter. In the month of May following, they may be allowed to paſture freely every day, and to remain out continually till the end of October, obſerving only not to permit them to eat the aftermaths. If accuſtomed to feed upon this delicate herbage, they will reject hay, which ought nevertheleſs, together with bran, to be their principal food during the ſecond winter. They are managed in the ſame manner, namely, allowing them to paſture in winter during the day, and in ſummer during both day and night, till they

arrive at the age of four years, when they are confined to dry food *. This change of nouriſhment requires ſome precautions. During the firſt eight days, they ſhould have only ſtraw; and a few vermifuge draughts may be given, to deſtroy thoſe worms which may have been engendered by the bad digeſtion of crude herbs. M. de Garſault † recommends this practice, the utility of which he had often experienced. It is, however, an eſtabliſhed fact, that the ſtomachs of horſes, at all ages, and in all circumſtances, whether they feed upon graſs, or upon oats and hay, are perpetually ſtuffed with a prodigious multitude of worms ‡. The ſtomach of the aſs is always in the ſame condition; and yet none of theſe animals are incommoded by this ſpecies of vermin. Theſe worms, therefore, ought not to be regarded as an accidental malady, occaſioned by the indigeſtion of crude herbs, but rather as an effect depending on the common food and ordinary digeſtion of the horſe and aſs.

After young colts are weaned, they ſhould not be put into too warm a ſtable, otherwiſe they will be rendered too delicate and too ſenſible to the impreſſions of the air. They ſhould

* This may be the practice in France; but, in Britain, horſes, of all ages, are allowed to paſture freely in ſummer, without receiving any injury.

† Nouveau parfait Maréchal, p. 84.

‡ This aſſertion appears to be too general; for, in this country, at leaſt, worms are by no means ſo frequent.

be

be often ſupplied with freſh litter, and kept clean by frequent friction. But they ought neither to be tied nor handled till they are near three years of age. The manger and rack ſhould not be too high; for the neceſſity of ſtretching their neck and raiſing their head, may induce a habit of keeping them in that poſition, which would ſpoil their neck. When 12 or 18 months old, their tails ſhould be cut; the hair will ſhoot afterwards, and become ſtronger and thicker. At the age of two years, the male colts ſhould be put with the horſes, and the females with the mares. Without this precaution, the young males would fatigue and enervate themſelves.

At the age of three years, or three and a half, we ſhould begin to dreſs the colts, and to render them tractable. At firſt, a light eaſy ſaddle ſhould be placed on them, and allowed to remain two or three hours each day. They ſhould likewiſe be accuſtomed to receive a ſnaffle into their mouths, and to allow their feet to be lifted and ſtruck, in imitation of ſhoeing. If deſtined for the coach or the draught, they ought to be harneſſed as well as ſnaffled. A bridle is unneceſſary at firſt: By means of a halter or caveſſon on their noſe, they may be made to trot up and down on a ſmooth piece of ground, with only a ſaddle and harneſs on their bodies: And, when they turn eaſily, and approach, without fear, the man who holds the *longe* or halter, they may then be mounted and diſmounted, without

making them walk, till they be four years old; for before this period, a horſe has not ſtrength enough to walk with a rider on his back. But, at four years, they may be mounted, and walked or trotted at ſmall intervals*. When a coach-horſe is accuſtomed to the harneſs, he may be yoked with a bred horſe, and guided with a *longe* or halter paſſed through the bridle, till he begins to know his duty. The coachman may next try to make him draw, with the aſſiſtance of a man to puſh him gently behind, and even to give him ſome ſlight laſhes. All this education ſhould be gone through, before the young horſes have their diet changed; for, after being fed with grain or ſtraw, they are more vigorous, and conſequently leſs docile, and more difficult to † break ‡.

The bit and the ſpur have been contrived to command the obedience of horſes; the bit for the direction, and the ſpur for the quickneſs of their movements. Nature ſeems to have deſtined the mouth ſolely for receiving the impreſſions of taſte and of appetite. But the mouth of the

* See Elements de Cavalerie de M. de la Gueriniere, tom. i. p. 140.

† Le Nouveau parfait Maréchal, par M. de Garſault, p. 86.

‡ By this management, it is admitted, that horſes may be eaſier broke. But, after they are allowed a full and generous diet, they are apt to become vitious and unruly. For this reaſon, connoiſſeurs in horſemanſhip maintain, that, to break horſes when they are in the higheſt order and beſt fed, is by much the moſt preferable mode.

horſe is endowed with ſuch amazing ſenſibility, that, to this organ, in place of the eye and ear, man applies for conveying the indications of his will to this animal. The ſlighteſt motion or preſſure of the bit gives him notice, and determines his courſe. This organ of ſenſation has no fault but that of perfection; its too great ſenſibility requires the moſt dexterous management; for the ſmalleſt abuſe ſpoils the mouth, by rendering it inſenſible to the impreſſions of the bit. The ſenſes of ſeeing and hearing cannot be blunted in this manner: But it is probable, that all attempts to govern horſes by theſe organs have been found inconvenient. Beſides, the ſigns tranſmitted by the touch have a ſtronger effect upon animals in general, than thoſe conveyed by the eye or ear. The ſituation of a horſe's eyes, with regard to his rider or conductor, is extremely unfavourable: And though they be often animated and conducted by the ear, it appears that the uſe of this organ is abandoned to the coarſer ſpecies of horſes; for, in the menage, they are ſeldom addreſſed by the ear. In a word, when horſes are well educated, the ſmalleſt preſſure of the thighs, the ſlighteſt movement of the bit, are ſufficient to direct them. Even the ſpur is almoſt uſeleſs, being ſeldom employed but to force them to exert violent motions: And when, from the ignorance of the horſeman, he gives the ſpur, and at the ſame time retracts the bridle, the horſe, finding himſelf incited on

one ſide and reſtrained on the other, is obliged to rear, or make a perpendicular bound.

By means of the bridle, the horſe is taught to keep his head in the moſt beautiful and advantageous ſituation, and the ſmalleſt ſign or ſlighteſt movement of the rider is ſufficient to make the animal aſſume its different paces. The trot is perhaps the moſt natural motion of a horſe; but the pace, and even the gallop, are moſt eaſy to the rider; and theſe are the two motions which are moſt in requeſt. When a horſe lifts his fore-leg in order to walk, this movement muſt be made with ſteadineſs and facility, and the knee muſt likewiſe be bended. The lifted leg muſt appear, for a moment, to be ſupported, and, when let down, it muſt be firm, and equally ſupported on the ground, before the head receive any impreſſion from this movement; for, when the leg falls ſuddenly down, and the head ſinks at the ſame time, this motion is generally made to give a ſpeedy relief to the other leg, which is not ſtrong enough alone to ſupport the whole weight of the body. This is a very great defect in a horſe. It is alſo worthy of remark, that, when he reſts on his heels, it is a ſign of weakneſs*; and when he ſupports himſelf on his toes, it is an unnatural and fatiguing attitude, which the horſe cannot long continue.

* The only ſure mark of ſtrength and ſoundneſs in a horſe, is when he reſts firmly upon his foot, without favouring any particular part of it.

Walking,

Walking, though the ſloweſt of all motions, ought to be briſk, light, and neither too long nor too ſhort. Lightneſs depends much on the freedom of the ſhoulders, and is diſtinguiſhed by the manner in which the horſe, in walking, carries his head. If he carries his head high and ſteady, he is generally vigorous and light. When the movement of the ſhoulders is not ſufficiently free, the limbs are not lifted high enough, and the horſe is apt to ſtumble upon the road. In walking, a horſe ſhould raiſe his ſhoulders, and lower his haunches*. He ſhould alſo ele-vate

* It may be of uſe to introduce here an explanation of the technical terms generally employed to expreſs the different external parts of a horſe. See the plate of the horſe.

A The two bones correſponding to the *temples* of a man, and called by the ſame name.

B The *eye-pits*, or two cavities between the eye and ear, above the eye brows.

C The *vives*. The parotid glands, ſituated between the ear, and the locking of the under jaw.

D The *face* or *chanfrin*. The fore part of the head from the eyes to the noſtrils.

E The *rim of the noſtrils*. The cartilage which forms the circular aperture of the noſtrils, and terminates them above and below.

F *Tip of the noſe*. The partition which divides the noſtrils, terminating at the upper lip.

G to H The bones of the lower jaw.

H The *chin*.

I The beard.

Gatherers. The two fore teeth.

Middle teeth. Thoſe adjoining to the gatherers.

Corner teeth. The laſt on each ſide.

Tuſks,

vate and support his leg; but, if he supports it too long, and allows it to fall down slowly, he loses

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Tushes. The two canine teeth on each side, and in each jaw.

Bars. The spaces between the cutting teeth and grinders, filled with ridges, which run across the palate.

K The *Neck*, which is bounded above by the mane, and below by the throat, extending from the shoulders to the head.

L The *Tuft* or *Toupet*. That part of the mane which lies between the two ears, and hangs down on the front.

M The *Withers*. The place where the two shoulders approach each other between the neck and back.

N The *Shoulders*, extending from the withers M, to the top of the *fore hand*, or fore-leg O.

P The *Chest* or breast.

Q The *Back*, reaching from the withers M, to the reins S.

R The *Navel*. The part between the back and reins; a very absurd term, as the *navel* is in the lower part of the belly.

S The *Reins*. This term is often used, though improperly, to express the whole spine of the horse.

T The *Sides*, which are formed and limited by the ribs.

V The *Coffer*. The hollow formed by the contour of the ribs. The name *Belly* is given to the part extending from V. to the flank.

X The *Flanks*. The extremity of the belly, at the termination of the ribs, below the kidneys, and reaching to the haunch-bones.

Y The *Haunch*, formed, as in man, by the haunch-bone.

Z The *Crupper*, which is round, and reaches from the kidneys to the tail.

The *Tail* is distinguished by two parts, the *hair* and the *rump*.

a The *Buttocks*, are situated below the crupper and the origin of the tail, and extend to the place where the hind-leg joins the body.

b The *Shoulder-blade*.

c The humerus. Both of these are included by horsemen under the name of *Shoulder*.

d The *Elbow*.

e The *Arm*.

 f The

loses every advantage of lightness; his walk becomes hard, and he is good for nothing but state and parade.

But

f The *Knee*, or joint situated below the arm, a term improperly applied to a horse, as it corresponds to the wrist in man.

g The *Shank* or *canon*. The second part of the fore-leg. It begins at the articulation of the knee, terminates at the fetlock joint *i*, and answers to the metacarpus in man.

h The *Tendon*, commonly called the back-sinew.

i The *Fetlock* joint.

k The *Tuft* of hair which surrounds a kind of soft horn situated behind the shank.

l The *Pasterns*. The part of the leg which extends from the fetlock-joint to the hoof.

m The *Coronet*. The place where the hoof joins the leg, and is decorated with long hair falling down all around the hoof.

n The *Hoof* represents the nail in man; the fore-part of it *n* is called the *Toe*, and the sides *o* the *Quarters*. The hind-part of the hoof is a little raised, and divided into two parts, both included under the name *Heel*: They extend to the middle of the under part of the foot, and uniting again under the sole, or bottom of the foot, form the *Frog*.

p The *Stifle*, is properly the articulation of the knee, and contains the knee-pan.

q The *Thigh*. It extends from the stifle and extremity of the buttocks to the ham *r*, and answers to the leg in man. Accordingly, the horse's thigh has a fleshy part *s*, resembling the calf of a human leg.

t The *Hock* or *ham*, is the joint at the extremity of the thigh, and bends forwards. This articulation corresponds with the *Tarsus* in man. The hinder-part of the joint called the hock, is properly the *Heel*. What is commonly called the *great sinew*, which arises from the point of the hock, and terminates in the foot, is a tendon, answering to the *tendo Achillis* inserted into the human heel.

u The *Shank*.

x The *Pastern-joint*.

y The

Plate XI.

A. Bell Sculp.

HORSE

But lightneſs is not the only good quality in the movements of the horſe: They ſhould likewiſe be equal and uniform both before and behind: For, if the crupper vibrates when the ſhoulders are ſupported, his motion will be jolting and incommodious to the rider. The ſame thing happens, when the horſe lengthens ſo much the ſtep of the hind-leg, that the foot lights beyond the print of the fore-foot. Horſes with ſhort bodies are ſubject to this fault. Thoſe whoſe legs croſs each other, or hew, have an unſteady motion; and, in general, long-bodied horſes are moſt commodious to the rider, becauſe he is placed at a greater diſtance from the two centres of motion, the ſhoulders and haunches, and is of courſe leſs jolted.

y The *Paſterns.*
z The *Foot*, as in the fore-leg.

This explanation of the particular terms, will render the general ones more eaſy and ſimple. A horſe is divided into three principal parts, the *fore hand*, the *body* or *carcaſe*, and the *hind-hand*. The *fore-hand* includes the head, neck, withers, breaſt, and fore legs. The body is compoſed of the back, kidneys, ribs, belly, and flanks. The *hind-hand* comprehends the rump, haunches, tail, buttocks, ſtiffle, thighs, hocks, and the other parts of the hind-legs.

By another mode of diviſion, the horſe is diſtinguiſhed into four parts, the head, the body, and the fore and hind trains. The *body* is compoſed of the back, the kidneys, the belly, the ribs, and the flanks. The *fore train* conſiſts of the neck, the ſhoulders, the breaſt, and the fore-legs; and the *hind-train*, of the rump, the tail, the haunches, and the hind-legs.

The general mode of walking among quadrupeds is to lift, at one time, a fore-leg and a hind-leg of oppoſite ſides. As their bodies reſt on four points which form an oblong ſquare, the moſt commodious manner of moving is to change two at a time in the diagonal; ſo that the centre of gravity of the animal's body may always remain nearly in the direction of the two points of ſupport which are not in motion. In the three natural movements of the horſe, namely, the walk, the trot, and the gallop, this mode is always obſerved, though with ſome variations. In walking there are four beats or times of moving; if the right fore-leg moves firſt, the left hind-leg inſtantly follows; then the left fore-leg moves, and is inſtantly followed by the right hind-leg. Thus the right fore-foot reſts firſt on the ground, then the left hind-foot, next the left fore-foot, and, laſtly, the right hind-foot, which makes a motion conſiſting of four beats and three intervals, of which the firſt and third are ſhorter than the middle one. In the trot, there are only two beats: If the right fore-leg parts from the ground, it is accompanied, at the ſame time, by the left hind-leg; then the left fore-leg moves at the ſame time with the right hind-leg; ſo that, in this motion, there are but two beats and one interval; the right fore-leg and the left hind-leg reſts on the ground at the ſame time, and the ſame thing happens with regard to the left fore leg and the right hind leg. In the gallop, there

there are commonly three beats: The left hind-leg moves firſt and reſts firſt on the ground; then the right hind-leg is raiſed along with the left fore-leg, and both reſt on the ground at the ſame time; and, laſtly, the right fore-leg is raiſed inſtantly after the left fore-leg and the right hind-leg, and falls laſt upon the ground. Thus, in the gallop, there are three beats and two intervals: In the firſt interval, when the motion is quick, the four legs, for an inſtant, are in the air at the ſame time, and the four ſhoes appear at once. When the horſe has ſupple limbs and haunches, and moves with agility, the gallop is moſt perfect, and the feet fall at four times, firſt, the left hind-leg, then the right-hind leg, next the left fore-leg, and, laſtly, the right fore-leg.

Horſes generally gallop upon the right foot, in the ſame manner as they ſet out in walking or trotting, with the right fore-leg. In galloping, they firſt cut the road with the right fore-leg, which is farther advanced than the left; and the right hind-leg, which immediately follows the right fore-leg, is likewiſe farther advanced than the left hind-leg. Hence the left leg, which bears the whole weight, and puſhes the others forward, has the greateſt fatigue; ſo that it would be proper to learn horſes to gallop alternately upon the left and right legs; becauſe it would enable them to continue this violent motion much longer. This is practiſed at the

 menage,

menage, but perhaps for no other reafon, but becaufe, in galloping round a circle, the centre of which is fometimes on the right, and fometimes on the left, the rider is frequently obliged to change his hand.

In walking, the horfe raifes his feet very little above the furface; in trotting, he elevates them a little more, and, in galloping, ftill higher. The walk ought to be fmart, light, and fure; the trot fhould be firm, quick, and equally fupported, and the fore-legs pufhed with rapidity by the hind ones. The trotting horfe fhould carry his head pretty high, and keep his body ftraight; for, if the haunches rife and fall alternately at every movement, and if the crupper rocks, the animal is too weak for this motion. To throw the fore-legs out is another fault: They ought always to be on the fame line with thofe behind, and to efface their prints *. When one of the hind-legs moves, and if the fore-leg on the fame fide refts too long, the movement becomes hard by this refiftance. It is for this reafon, that the interval between the two beats of the trot ought to be fhort: But, however fhort it may be, this refiftance is fufficient to make the trot harder than the walk or gallop.

* Here the author differs from all our expert horfemen, who uniformly prefer thofe horfes which go wider behind than before; becaufe horfes of this kind are not fo apt to cut their legs, are more agile in their movements, and can fupport greater fatigue in long journeys, &c.

The ſpring of the hocks contributes as much to the motions of galloping as that of the loins. While the latter make an effort to elevate and puſh forward the anterior parts, the ſpring of the hocks breaks the ſtroke and ſoftens the ſhock. Hence the more uniform and ſtrong the ſpring of the hocks, the gallop is ſofter and more rapid.

Though walking, trotting, and galloping, be the natural and ordinary movements of horſes, yet ſome of them have another natural motion, known by the name of *ambling*, or *pacing*, which is very different from the other three; and though leſs quick than the hard trot or gallop, it appears, at firſt ſight, to be extremely fatiguing to the animal. The foot of the horſe, in this movement, grazes the ſurface ſtill nearer than in walking, and each ſtep is much longer. But, what is ſingular, to make a pace, the two legs of the ſame ſide part from the ground at the ſame time, the fore and hind leg, for example, of the right ſide, and then the two legs of the left ſide; ſo that each ſide of the body alternately want ſupport, which muſt greatly fatigue the animal, who is obliged to ſupport a balance forced by the rapidity of a movement which is hardly elevated above the ground; for nothing but the rapidity of the motion, and the ſmallneſs of the elevation, could poſſibly prevent the creature from falling on his ſide. In the motion of pacing, as in that of trotting, there are

 only

only two beats. This movement, which is very laborious to the horſe, and in which he ought not to be indulged except on ſmooth ground, is very eaſy to the rider; it has not the hardneſs of the trot, becauſe the hind leg moves along with the fore one, and creates no reſiſtance to the motion. We are told by connoiſſeurs, that horſes which naturally amble, never trot, and that they are much weaker than thoſe which have no ſuch movement. Colts, indeed, often aſſume this mode of moving, when forced to go quick, and when they have not ſtrength enough to trot or to gallop; and even good horſes, after being fatigued, or when they begin to decay, are apt, when puſhed, to amble ſpontaneouſly *.

The amble may be therefore regarded as a motion occaſioned by weakneſs or defect. But there are two other movements aſſumed ſpontaneouſly by weak or decayed horſes, which are ſtill more defective than that of the amble, and are known by the name of *Broken ambles*. The one is a motion between walking and ambling, and the other between trotting and galloping. Both proceed from great fatigue, or weakneſs in the loins, and are conſpicuous in many of our hackney and poſt-horſes.

Of all quadrupeds, the horſe poſſeſſes, along with grandeur of ſtature, the greateſt elegance and proportion of parts. By comparing him with the animals immediately above or below

* See l'Ecole de Cavalerie de M. de la Gueriniere, p. 77.

him,

him, we find that the aſs is ill made; that the head of the lion is too large; that the limbs of the ox are too ſlender and too ſhort, in proportion to the ſize of his body; that the camel is deformed; and that the groſſer animals, as the rhinoceros and elephant, may be conſidered as rude and ſhapeleſs maſſes. The great difference between the head of man and that of the quadrupeds, conſiſts in the length of their jaws, which is the moſt ignoble of all characters. But, though the jaws of the horſe be very long, he has not, like the aſs, an air of imbecility, nor, like the ox, of ſtupidity. The regularity and proportion of the parts of his head give him a light and ſprightly aſpect, which is well ſupported by the beauty of his cheſt. He elevates his head, as if anxious to exalt himſelf above the condition of quadrupeds. In this noble attitude, he regards man face to face. His eyes are open and lively, his ears handſome and of a proper height, being neither too long, like thoſe of the aſs, nor too ſhort, like thoſe of the bull. His mane adorns his neck, and gives him the appearance of ſtrength and of courage. His long buſhy tail covers and terminates with advantage the extremity of his body. His tail, very different from the ſhort tails of the deer, elephant, &c. and from the naked tails of the aſs, camel, rhinoceros, &c. is formed of long thick hairs which ſeem to ariſe from his crupper, becauſe the trunk from which they proceed is very ſhort.

ſhort. He cannot, like the lion, elevate his tail, but, though pendulous, it becomes him better: And, as he can move it from ſide to ſide, it ſerves him to drive off the flies which incommode him; for, though his ſkin be very firm, and well garniſhed with cloſe hair, it is extremely ſenſible.

The attitude of the head and neck contributes more than all the other parts of his body, to give him a graceful aſpect. The ſuperior part of the neck from which the mane iſſues, ſhould firſt riſe in a ſtraight line from the withers, and then, as it approaches the head, form a curve nearly ſimilar to that of a ſwan's neck. The inferior part of the neck ſhould have no curvature, but riſe in a ſtraight line from the poitrel, or breaſt, to the under jaw, with a ſmall inclination forward. If it roſe in a perpendicular direction, its ſymmetry and gracefulneſs would be diminiſhed. The ſuperior part of the neck ſhould be thin, with little fleſh near the mane, which ought to be garniſhed with long delicate hair. A fine neck ſhould be long and elevated, but proportioned to the general ſize of the animal. When too long, the horſe commonly throws back his head; and, when too ſhort and fleſhy, the head is heavy to the hand. The moſt advantageous poſition of the head is, when the front is perpendicular to the horizon.

The head of a horſe ſhould be thin and meagre, and not too long. The ears ſhould be

ſmall,

ſmall, erect, but not too ſtiff, narrow, and placed on the upper part of the head, at a proper diſtance from each other. The front ſhould be narrow and a little convex, the eye-pits, or hollows between the eyes and ears, well filled, and the eye-lids thin; the eyes ſhould be pretty large and prominent, clear, lively, and full of fire; the pupil ſhould be rather large, the under jaw a little thick, but not fleſhy, the noſe ſomewhat arched, the noſtrils open and deep, and divided by a thin ſeptum or partition. The mouth ſhould be delicate and moderately ſplit, lips thin, withers ſharp and elevated, the ſhoulders flat, and not confined; the back equal, a little arched lengthwiſe, and raiſed on each ſide of the back-bone, which ought to have the appearance of being ſunk; the flanks ſhould be ſhort and full, the crupper round and plump, the haunches well furniſhed with muſcular fleſh, the dock or fleſhy part of the tail firm and thick, the thighs large and fleſhy, the hock round before, broad on the ſides, and tendinous behind; the ſhank thin before, and broad on the ſides; the tendon (or tendo Achillis) prominent, ſtrong, and well detached from the leg-bone, and the fetlock ſomewhat prominent, and garniſhed with a ſmall tuft of long hair behind; the paſterns ſhould be of a middling length, and pretty large; the coronet a little elevated, the hoof black, ſolid, and ſhining, the inſtep high, the quarters round, the heels broad, and a little prominent,

the

the frog thin and ſmall, and the ſole thick and concave.

Few horſes poſſeſs all theſe perfections. The eyes are ſubject to many faults, which it is often difficult to diſtinguiſh. In a ſound eye, two or three ſoot-coloured ſpots appear through the cornea above the pupil; for, unleſs the cornea be clean and tranſparent, theſe ſpots cannot be ſeen. When the pupil is ſmall, long, and narrow, or ſurrounded with a white circle, or when it is of a greeniſh blue colour, the eye is unqueſtionably bad *.

Without entering into a long detail, the following general remarks will enable the reader to form a judgment of the principal perfections and imperfections of a horſe. The motion of the ears affords a tolerable criterion: When a horſe walks, the point of his ears ſhould incline forwards; when fatigued, his ears hang down; and, when angry, or of a malignant diſpoſition, he points alternately one of his ears forwards, and another backwards. Every horſe turns his ears to that ſide from which he hears any noiſe; and when ſtruck on the back or on the crupper, he turns his ears backward. Horſes with hollow eyes, or with one eye ſmaller than the other, have generally a bad ſight. Thoſe whoſe mouths are dry have not ſuch good conſtitutions

* There are many other marks of bad eyes; but, as their colour depends much on the light in which they are viewed, little information can be derived from it.

as thoſe that have moiſt mouths, and foam with the bit *. The ſhoulders of a ſaddle-horſe ſhould be flat, ſupple, and not too fleſhy. A draught-horſe, on the contrary, ought to have thick, round, fleſhy ſhoulders. If, however, the ſhoulders of a ſaddle-horſe be too meagre, and the bones advance too much through the ſkin, it is an indication that his ſhoulders are not free, and that, of courſe, he will be unable to undergo much fatigue. Another defect of a ſaddle-horſe is to have the poitrel, or breaſt, too prominent, and the fore-legs inclined or placed too far backward; becauſe, in this caſe, he is ſubject to lean heavy upon the hand in galloping, and even to ſtumble and fall. The length of the legs ſhould be proportioned to the ſtature of the horſe. When the fore-legs are too long, he is not ſteady on his feet; and, when too ſhort, he bears heavy on the hand. It has been remarked, that mares are more liable than horſes to be low before, and that ſtone-horſes have thicker necks than mares or geldings.

It is of great importance to know the age of a horſe. The eye-pits of old horſes are commonly hollow: But this mark is equivocal; for young horſes begot by old ſtallions have likewiſe hollow eye-pits. The teeth afford the beſt criterion of the age of horſes. The horſe has, in all, 40 teeth, viz. 24 grinders, 4 canine, or tuſhes, and

* A dry or wet mouth is a conſequence of the particular ſtate of the body at the time; and, therefore, can be no indication of the general conſtitution or ſtrength of a horſe.

fore-

12 fore-teeth. Mares have either no dog-teeth, or very ſhort ones. The canine and fore-teeth only afford indications of the age. Five days after birth, the fore-teeth begin to ſhoot. Theſe firſt teeth are round, ſhort, and not very ſolid; and they fall out at different times, to be replaced by others. At two years and a half, the four middle fore-teeth fall out, two above and two below. The next year, other four are ſhed, one on each ſide of the firſt, which are now replaced. At four years and a half, other four fall out, always on each ſide of thoſe which were formerly ſhed and replaced. Theſe laſt four foal-teeth are ſucceeded by other four, which grow not near ſo quickly as the firſt eight. It is from theſe four, called corner teeth, that the age of a horſe is diſtinguiſhed; and they are eaſily known, being always the third, both above and below, reckoning from the middle to the extremity of the jaw. They are hollow, and have a black mark in their cavities. At four and a half, or five years, theſe teeth hardly riſe above the gums, and their cavities are very perceptible. At ſix years and a half, the cavities begin to fill up, and the mark gradually diminiſhes till the animal is ſeven and a half, or eight years, when the cavities are perfectly filled, and the mark totally effaced. After this period, the age is attempted to be diſcovered by the tuſhes or canine teeth. Theſe four teeth lie immediately adjacent to the other four

above

above deſcribed. Neither the tuſhes nor grinders ſhed. At the age of three years and a half, the two tuſhes of the under jaw generally begin to ſhoot; the two of the upper jaw appear at the age of four, and, till ſix years be completed, they are very ſharp. At ten years, the tuſhes of the upper jaw ſeem to be blunted, worn out, and long, becauſe the gums retract with age; and the more this appearance takes place, the older is the horſe. From ten to thirteen or fourteen years, there are hardly any marks by which the age may be diſcovered. Some hairs of the eye-brows, indeed, begin to grow white; but this mark is equally equivocal as that derived from the depth of the eye-pits; for, it has been remarked, that horſes begot by old ſtallions and old mares, have white hairs in the eye-brows at the age of nine or ten. The teeth of ſome horſes are ſo hard, that they wear not by eating, and never loſe the black mark. But theſe horſes are eaſily known, becauſe the cavities of their teeth are perfectly filled up, and their tuſhes are very long*. The age of a horſe may likewiſe be known, though with leſs preciſion, by the bars or ridges of the palate, which are effaced in proportion as he advances in years.

At the age of two years, or two and a half, the horſe is in a condition to propagate; and the mares, like moſt other females, are ſtill ſooner ripe for this operation. But the foals produced from ſuch early embraces are weakly,

* See l'Ecole de Cavalerie de M. de la Gueriniere [illegible] 25.

or

or ill-formed. The horſe ſhould never be admitted to the mare till he is four or four and a half; and even this period is too early, except for coarſe or draught-horſes. When fine horſes are wanted, the male ſhould not be admitted to the mare before he is ſix years old; and Spaniſh ſtallions not till they be full ſeven. The mares may be one year younger: They generally come in ſeaſon from the end of March to the end of June. But their chief ardour for the horſe laſts not above 15 days or three weeks; and, during this critical period, the mare ſhould be admitted to the ſtallion: He ought to be ſound, vigorous, well made, and of a good breed. To procure fine ſaddle-horſes, foreign ſtallions, as Arabians, Turks, Barbs, and Andalouſians, are preferable to all others. Next to theſe, Britiſh ſtallions are the beſt; becauſe they originally ſprung from thoſe above mentioned, and are very little degenerated. Italian ſtallions, eſpecially thoſe of Naples, are extremely good. With mares of a proper ſize, they produce excellent horſes for the ſaddle; and with ſtrong large mares, they produce good coach horſes. It is alledged, that, in France, Britain, &c. the Arabian and Barbary ſtallions generally beget horſes larger than themſelves; and that thoſe of Spain, on the contrary, produce a breed more diminutive. The beſt ſtallions for coach-horſes are thoſe of Naples, Denmark, Holſtein, and Frieſland. The ſtallions for ſaddle-horſes ſhould be * four feet

* Fourteen hands and a half.

 eight

eight or ten inches, and five feet *, at leaſt, for coach-horſes. Neither ought the colour of ſtallions to be overlooked, as a fine black, gray, bay, ſorrel, &c. All party-coloured, or ill defined colours, ought to be baniſhed from the ſtud, as well as every horſe which has white extremities. Beſides theſe external qualities, a ſtallion ſhould be endowed with courage, tractability, and ſpirit; he ſhould have agility, a ſenſible mouth, and ſure limbs; his ſhoulders ſhould be perfectly free, and his haunches ſupple; he ſhould have a ſpring and elaſticity in his whole body, eſpecially in his hind legs; and he ought to be trained and dreſſed in the riding-ſchool. Theſe precautions in the choice of a ſtallion are the more neceſſary, becauſe it has been found by experience, that he communicates to his offspring almoſt all his good or bad qualities, whether natural or acquired. A horſe naturally croſs, ſkittiſh, reſtive, &c. produces foals of the ſame diſpoſitions: And, as the defects of conformation and the vices of the humours are more certainly perpetuated than the qualities of the temper, one ſhould reject from the ſtud every horſe that is deformed or diſeaſed, extremely vicious, glandered, broken-winded, frantic, &c.

In our climate, the mare contributes leſs to the beauty of her offspring than the ſtallion; but ſhe contributes more, perhaps, to their ſtature and conſtitution. It is, therefore, of great im-

* Fifteen hands.

 por[tance.]

portance, that mares for breed ſhould be ſound, tall, large, roomy in the trunk of the body, and good nurſes. For elegant horſes, Spaniſh and Italian mares are beſt; but, for draught-horſes, thoſe of Britain and Normandy are preferable. However, when the ſtallions are good, fine horſes may be produced from mares of any country, provided they be well made and of a good breed; for, if the mares have ſprung from a bad ſtallion, their offspring are generally defective. In horſes, as in the human ſpecies, the young very frequently reſemble either their male or female predeceſſors; only, it ſhould appear, that, among the horſe-kind, the female contributes leſs to the work of generation than in the human ſpecies. The ſon more frequently reſembles his mother than the foal does the mare from which he is produced; and, when the foal happens to reſemble his mother, the likeneſs is generally confined to the anterior parts of the body, as the head and neck.

To judge of the reſemblance of children to their parents, the compariſon ought not to be made till after the age of puberty. For, at this period, ſo many changes take place, that a perſon, with whom we were formerly familiar, we will hardly, at firſt ſight, be able to diſtinguiſh. In the human ſpecies, the ſon, after puberty, often reſembles the father, and the daughter the mother, and, not unfrequently, each retains a partial likeneſs to both parents; and this family-

likeneſs

likeneſs is generally recogniſable in uncles, aunts, and in every aſcending or deſcending branch. Among horſes, as the male contributes more to the offspring than the female, mares very frequently produce foals which have a great reſemblance to the ſtallion, or which always reſemble the father more than the mother. And, even when the mare has been begot by a bad horſe, it often happens, that, though ſerved by a good ſtallion, and though handſome herſelf, her offspring, though beautiful and well made at firſt, gradually decline as they grow up; and other mares, ſprung from a good race, produce foals, which, though they have an unpromiſing aſpect when young, improve as they advance in years.

Theſe facts, though they ſeem to concur in proving that the males have greater influence on the offspring than the females, appear not to be ſufficient to render this point altogether unqueſtionable. It is by no means ſurpriſing, that ſtallions, which are always ſelected from a great number, generally imported from a warm climate, and fed and managed with the greateſt care and circumſpection, ſhould prevail, in the buſineſs of generation, over common mares, bred in a cold country, and often ſubjected to hard labour. If mares were ſelected from warm climates, managed with equal attention, and ſerved with the common ſtallions of our own country, I have not the ſmalleſt doubt, that, in this

this caſe, the ſuperiority of the females would be equally apparent as that of the males; and, in general, that, among horſes, as well as the human ſpecies, the influence of both parents, when placed in equal circumſtances, is nearly the ſame. What renders this opinion both more natural and more probable, is the well known fact, that, in ſtuds, the number of females produced is equal to that of the males; which is a clear proof, that, with regard to ſex at leaſt, the female contributes her full proportion.

But, to return to our ſubject. When the ſtallion is choſen, and the mares are aſſembled, another ſtone-horſe ſhould be allowed to teaze them, for no other purpoſe but to diſcover thoſe which are in ſeaſon. Thoſe that are not in proper condition repel his attacks. But, inſtead of allowing him to proceed with the mares which are in ſeaſon, he is led off, and the true ſtallion is ſubſtituted in his place. This trial is chiefly uſeful for diſcovering the condition of ſuch mares as have never produced; for thoſe which have produced are commonly in ſeaſon nine days after their delivery, and may be ſafely covered on the tenth day. Nine days after, their condition may be tried by the above proof, and, if ſtill in ſeaſon, they ſhould be covered a ſecond time, and ſo on every ninth day, till their ardour abates, which happens a few days after conception. But, to conduct this matter properly, requires conſiderable attention and expence. The

 ſtud

ſtud ſhould be eſtabliſhed on good ground, and its dimenſions proportioned to the quantity of mares and ſtallions employed. This ground ſhould be divided into ſeveral apartments, and well fenced with ditches or hedges. The impregnated mares, and thoſe which are ſuckling their young, ſhould have the richeſt paſture. Another encloſure, where the graſs is leſs rich, ſhould contain the uncovered mares, thoſe that have not conceived, and the female foals; for a rich paſture makes them grow too fat, and weakens the generative faculty. Laſtly, the young male foals and geldings ſhould be confined to the drieſt and moſt unequal part of the ground, that, by aſcending and deſcending the eminences, they may acquire a freedom in their limbs and ſhoulders. This laſt encloſure ſhould be well fenced from that which contains the mares, to prevent the young horſes from enervating themſelves by premature efforts. If the field be ſufficiently extenſive, each of theſe encloſures ſhould be divided into two, and grazed alternately by horſes and oxen. This mode of grazing improves the paſture; for the ox repairs what is injured by the horſe. Each park ſhould likewiſe be furniſhed with a pond, which is better than a running water, and alſo with trees to ſhelter the animals from too much heat; but, to prevent accidents, all old ſtumps ſhould be rooted out, and deep holes filled up. Theſe paſtures will afford ſufficient nouriſhment to the ſtud du-

ring the ſummer; but, in winter, the mares and foals ſhould be put into ſtables, and fed with hay, except in very fine weather, when they may be ſet out to paſture during the day. The ſtallions ſhould be always kept in the ſtables, fed with a greater proportion of ſtraw than of hay, and moderately exerciſed till the time of covering, which generally laſts from the beginning of April till the end of June. During this period, they ſhould be fed plentifully, but with no other article than their ordinary food.

When the ſtallion is conducted to the mare, to augment his ardour, he ſhould be well dreſſed. The mare ſhould have the ſhoes taken off her hind feet; for ſome of them are apt to kick at the approach of the ſtallion. One man holds the mare by the head, and two others lead the ſtallion by long reins. When in a proper ſituation, he ſhould be aſſiſted by the hand, by turning aſide the tail of the mare; for the oppoſition of a ſingle hair might wound him in a dangerous manner. The ſtallion ſometimes quits the mare without conſummating. If the trunk of his tail near the crupper vibrates before he deſcends, we may be certain that he has conſummated; for this motion always accompanies emiſſion. After conſummation, the act ſhould not be reiterated; but he ought to be carried back immediately to the ſtable, there to remain two days: For, though a horſe might be able to cover every day during the ſeaſon; yet, if only admitted

admitted once in two days, he is both more vigorous and more successful. During the first seven days, therefore, let him have four different mares, and, on the ninth, let him again cover the first mare, and so on as long as they continue in season. When one of the mares ceases to be ardent, another should be substituted in her place; and, as many are impregnated at the first, second, or third time, a stallion, managed in this manner, may cover 15 or 18 mares, and produce 10 or 12 foals, during the three months that these amours continue. Stallions throw out a vast profusion of seminal fluid; mares likewise emit, or rather distil, a fluid during the time they are in season; and, as soon as they are pregnant, these emissions cease. This fluid was called *Hippomanes* by the Greeks; and of it they are said to have made love-potions, which rendered horses, in particular, frantic with desire. The hippomanes is totally different from the fluid found in the membranes that cover the foal, which was first discovered and described by M. Daubenton *. The appearance of the hippomanes is the most certain mark of ardour in mares. This passion may likewise be discovered by the swelling of the under part of the vulva, and by the frequent neighing of the mares, who, at this period, have a strong desire of approaching the horse. After a mare has been covered, she may be led to the pasture

* Mem. de l'Acad. des Sciences, année 1751.

without any other precaution. The firſt foal is always more puny than the ſubſequent ones: To compenſate this defect, a mare ſhould be ſerved, for the firſt time, with a large ſtallion. The differences in the figures of the horſe and mare ſhould be attended to, in order to correct the faults of the one by the perfections of the other; and no diſproportioned conjunctions ought to be admitted, as of a ſmall horſe and a large mare, or of a large horſe and a ſmall mare; for the produce of ſuch conjunctions will either be ſmall or ill proportioned. In order to improve Nature, we muſt advance by gradual ſteps: A plump but handſome horſe, for example, may be admitted to a mare that is too groſs, a ſmall mare to a horſe a little taller, a mare with a bad fore-hand to a horſe with a fine head, neck, &c.

It has been remarked, that ſtuds kept in dry light ſoils produce active, nimble, and vigorous horſes, with nervous limbs and ſtrong hoofs; while thoſe kept in moiſt ground, and in too rich paſturage, have generally large heavy heads, groſs bodies, thick legs, bad hoofs, and broad feet. It is eaſy to perceive that theſe differences proceed from the varieties in climate and food. But the neceſſity of croſſing the breed, to prevent the degeneration of horſes, is more difficult to underſtand, and of more importance to be known.

There is in Nature a general prototype of every ſpecies, upon which each individual is modelled,

delled, but which ſeems, in its actual production, to be depraved or improved by circumſtances; ſo that, with regard to certain qualities, there appears to be an unaccountable variation in the ſucceſſion of individuals, and, at the ſame time, an admirable uniformity in the entire ſpecies. The firſt animal, the firſt horſe, for example, has been the external and internal model, upon which all the horſes that have exiſted, or ſhall exiſt, have been formed. But this model, of which we know only copies, has had, in communicating and multiplying its form, the power of adulterating or of improving itſelf. The original impreſſion is preſerved in each individual. But among millions of individuals, not one exactly reſembles another, nor, of courſe, the model from which they ſprung. This difference, which ſhows that Nature is not abſolute, but knows how to vary her works by infinite ſhades, is equally conſpicuous in the human ſpecies, in all animals, and in all vegetables. What is ſingular, this model of the beautiful and the excellent, ſeems to be diſperſed over every region of the earth, a portion of which reſides in all climates, and always degenerates, unleſs united with another portion brought from a diſtance. In order, therefore, to obtain good grain, beautiful flowers, &c. the ſeeds muſt be changed, and never ſown in the ſame ſoil that produced them. In the ſame manner, to have fine horſes, dogs, &c. the males and females of different

countries

countries muſt have reciprocal intercourſe. Without this precaution, all grain, flowers, and animals degenerate, or rather receive an impreſſion from the climate ſo ſtrong as to deform and adulterate the ſpecies. This impreſſion remains, but it is disfigured by every feature that is not eſſential. By mixing races, on the contrary, or by croſſing the breed of different climates, beauty of form, and every other uſeful quality, are brought to perfection: Nature recovers her ſpring, and exhibits her beſt productions.

I mean not to enter into a detail of the cauſes of theſe effects; but ſhall confine myſelf to ſuch conjectures as moſt readily preſent themſelves. We know by experience, that animals or vegetables, tranſported from diſtant climates, often degenerate, and ſometimes come to perfection, in a few generations. This effect, it is obvious, is produced by difference of climate and of food. The operation of theſe two cauſes muſt, in proceſs of time, render ſuch animals exempt from, or ſuſceptible of certain affections, or certain diſeaſes. Their temperament muſt ſuffer a gradual change. Of courſe, their form, which partly depends on food and the qualities of the humours, muſt alſo, in the courſe of generations, ſuffer an alteration. This change, it is true, is hardly perceptible in the firſt generation; becauſe the male and female, which we ſuppoſed to be the origin of this race, being fully grown, had received their form and ſtructure before they

were

were tranſported. The new climate and new food may change their temperament; but cannot have influence upon the ſolid and organic parts ſufficient to alter their form. The firſt generation of theſe animals, therefore, will not ſuffer any change in their figure; nor, at the inſtant of birth, will the ſtock be vitiated or depraved. But the young and tender ſtranger will feel a much ſtronger impreſſion from the climate than its father or mother experienced. The operation of food will likewiſe be ſo great as to influence the organic parts during the time of the animal's growth: A change will, of courſe, be introduced into its form; the ſeeds of imperfection will be ſown; and appear, in a ſenſible manner, in the ſecond generation, which will not only labour under its own proper defects, or thoſe proceeding from its growth and nouriſhment, but inherit all the vices of the ſecond ſtock. Laſtly, the imperfections and deformities tranſmitted to the third generation, being combined with the influence of the climate and food during the growth of the animal, will become ſo great as to obliterate entirely the characters of the original ſtock. Hence, in a few generations, animals tranſported into a climate different from their own, loſe all their diſtinctive qualities, and acquire thoſe peculiar to the country they are obliged to inhabit. In France, Spaniſh or Barbary horſes, when the breed is not croſſed, become French horſes, ſometimes in the ſecond generation,

neration, and always in the third. Inſtead of preſerving the breed diſtinct, therefore, it is neceſſary to croſs it every generation, by admitting Spaniſh or Barbary horſes to the mares of the country. It is ſingular, that this renewing of the race, which is only partial, produces better effects than if it were complete. A Spaniſh horſe and mare will not produce ſuch fine horſes in France, as thoſe bred from a Spaniſh horſe and a French mare. This may eaſily be conceived, if we attend to the compenſation of defects which neceſſarily happens, when males and females of different countries are allowed to intermix. Every climate, by its influence, joined to that of the food, gives a certain conformation of parts, which errs either by exceſs or defect. When a warm climate produces redundancies in particular parts, a cold climate gives riſe to deficiencies in the ſame parts. Hence, when animals of oppoſite climates intermix, an exact compenſation is effected. As the moſt perfect work of Nature is that in which there are feweſt defects, and as the moſt perfect forms are thoſe which have feweſt deformities, the production of two animals, whoſe faults exactly compenſate each other, will be the moſt perfect of the kind. Now, this compenſation being alway completeſt, when animals of remote, or rather of oppoſite climates, are joined, the compound reſulting from the mixture is more or leſs perfect, in proportion as the exceſs or defects in the conſtitution of

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the father are oppoſed to thoſe peculiar to the mother.

To have good horſes, therefore, in the temperate climate of France, ſtallions ſhould be brought from the warmeſt or the coldeſt countries. The Arabian or Barbary horſes ought to have the preference; and, after them, thoſe of Spain and of Naples. With regard to cold climates, the horſes of Denmark ſhould be preferred, and, next to them, thoſe of Holſtein and Frieſland. All theſe ſtallions, when admitted to French mares, will produce very fine horſes; and they will always be better and more beautiful, in proportion as the climate is more remote from that of France; ſo that the Arabian horſe is preferable to the Barb, and the Barb to the Spaniſh. In the ſame manner, ſtallions brought from Denmark will produce finer horſes than thoſe brought from Frieſland. When ſtallions from very warm or very cold countries cannot be procured, they ſhould be brought from England or Germany, or even from the ſouthern provinces of France to the northern. Some advantage is always obtained by ſerving mares with ſtrange horſes; for when thoſe of the ſame race, and in the ſame ſtud, are allowed to intermix, they infallibly degenerate in a very ſhort time.

The influence of climate and of food upon the human ſpecies, is not ſo great as upon other animals. The reaſon is obvious. Man defends himſelf better than any other animal from the intem-

intemperance of the climate. He accommodates his lodging and clothes to the nature of the season. His food is more various,, and, consequently, does not operate in the same manner upon every individual. The defects or redundancies which proceed from these two causes, and which are so constant and so perceptible in the animals, are by no means equally conspicuous in man. As migrations have often happened, as whole nations have intermixed, and as many men travel and disperse themselves through every quarter of the globe, it is not surprising that the human race are less subject to the influence of climate, and that strong, handsome, and even ingenious men, are to be found in every country. It is probable, however, that, from an experience, of which all remembrance is now lost, men had discovered the evils that result from alliances of the same blood; for even among the most unpolished nations, a brother has rarely been permitted to marry his sister. This custom, which, among Christians, is a divine law, and which is observed by other people from political motives, may have originally been founded on observation. Policy, unless when derived from physical considerations, never extends in a manner so general and so absolute. But, if men once discovered by experience that their race degenerated, when intercourse was permitted among children of the same family, they would soon regard the alliances of different families,

families, as a law eſtabliſhed by Nature. In a word, we may preſume from analogy, that, in moſt climates, men, like other animals, would degenerate after a certain number of generations.

The variety in the colour of animals is another effect to be aſcribed to the influence of climate and food. Wild animals which live in the ſame climate, are of the ſame colour, varying only in brightneſs or deepneſs, according to the ſeaſons of the year. Thoſe, on the contrary, which live under different climates, differ likewiſe in colour; and domeſtic animals are ſo prodigiouſly varied, that we have horſes, dogs, cats, &c. of every kind of colour. But the ſtag, the hare, &c. are uniformly of the ſame colour. The injuries received from the climate, which are always the ſame, and the conſtant eating of the ſame food, produce this uniformity in the wild animals. The care of man, the luxury of ſhelter, and the variety of nouriſhment, efface and variegate the original colours in domeſtic animals. The mixture of foreign races, eſpecially when the males and females are not of the ſame colour, produce the ſame effect, and ſometimes give riſe to beautiful varieties, as the pied horſes, in which the white and black are often diſpoſed in a manner ſo fanciful, as to ſeem to be rather the operation of art than of nature.

In coupling horſes, regard ſhould be had to the ſtature and the colour: The figures ſhould be

be contrasted, and the breed crossed by stallions from the most opposite climates. Horses and mares brought up in the same stud should never be allowed to intermix. These are essential requisites. But there are other circumstances which ought not to be neglected. For example, in a stud, no mares, with short tails, should be kept; because, being unable to defend themselves from the flies, they are perpetually tormented. The continual agitation occasioned by the stinging of these insects, diminishes the quantity of milk, which has so great an influence on the constitution and stature of the foal, that its vigour is always proportioned to the goodness of its nurse. Brood-mares should be chosen from those which have been always pastured, and never fatigued with labour. Mares which have been long nourished in a stable with dry food, and afterwards turned out to grass, conceive not at first. Time is necessary to accustom them to this new kind of nourishment.

The common season of mares is from the beginning of April to the end of June; but the ardour of some not unfrequently appears at a more early period. An ardour so premature should be repressed; because the foal would be brought forth in cold weather, and, consequently, suffer both from the intemperance of the season and from bad milk. If this ardour appears not till after the month of June, it should likewise be repressed; because the foal would be produced

produced in ſummer, and would not acquire ſtrength enough to reſiſt the rigors of winter.

Inſtead of conducting the ſtallion to the mare, it is not uncommon to allow him to go looſe in the parks where the mares are feeding, and to ſingle out ſuch as are in ſeaſon. By this method the mares conceive more readily. But it injures the ſtallion more in ſix weeks, than he would be by ſix years exerciſe, moderated and conducted in the manner above directed.

When the impregnated mares begin to grow heavy, they ſhould be ſeparated from thoſe which are not in that condition, to prevent them from receiving any injury. Their period of geſtation is generally eleven months and ſome days. They bring forth in a ſtanding poſture, while moſt other quadrupeds lie down. When the delivery is difficult, they require the aſſiſtance of man; and, when the foal is dead, it is extracted with cords. As in moſt animals, the colt firſt preſents its head. In eſcaping from the uterus it breaks the membranes, and the waters flow abundantly. The waters are accompanied with ſeveral ſolid maſſes, formed by the ſediment of the liquor of the allantoides. Thoſe maſſes, called *hippomanes* by the ancients, are not, as they ſuppoſed, pieces of fleſh attached to the head of the foal. They are, on the contrary, ſeparated from the foal by the *amnios*. Immediately after birth, the mare licks the foal: But ſhe never touches

touches the *hippomanes*, though the ancients assert that she instantly devours it.

It is usual to cover a mare nine days after she has foaled, that no time may be lost, and that every possible profit may be derived from the stud. It is certain, however, that her strength being divided, she is unable to nourish both a foal and a fœtus so successfully as if she had but one at a time. To procure excellent horses, therefore, the mares should be covered but once in two years, which would make them live longer, and hold more surely; for, in ordinary studs, it is well if a half or two thirds bring forth in a year.

Mares, though impregnated, can suffer to be covered; and yet there are no instances of superfœtation. In general, they are capable of producing to the age of 14 or 15 years, and the most vigorous produce not after 18. Stallions, when properly managed, retain their prolific powers to the age of 20 years, and sometimes longer: and, as in man, those which begin too early are soonest extinguished; for the large horses, which come sooner to maturity than fine ones, and are employed as stallions at the age of four years, are commonly useless at 15.

The life of horses, as in every other species of animals, is proportioned to the time of their growth. Man, who grows 14 years, can live six or seven times as long, i. e. 90 or 100. The horse whose growth is accomplished in four years,

years, can live ſix or ſeven times as much, i. e. 25 or 30. The exceptions to this rule are ſo few, that no concluſions can be drawn from them: And, as large horſes come ſooner to maturity than the delicate ones, their lives are likewiſe ſhorter, and they are ſuperannuated in 15 years.

In horſes, and moſt other quadrupeds, the growth of the poſterior parts ſeems at firſt to be greater than that of the anterior. But, in man, the growth of the inferior parts is at firſt leſs than that of the ſuperior: For the thighs and legs of infants are, in proportion to their bodies, much leſs than thoſe of adults. The hind legs of the foal, on the contrary, are ſo long that they can reach his head, which is by no means the caſe after he acquires his full growth. But this difference proceeds not ſo much from the inequality in the total growth of the anterior and poſterior parts, as from the unequal lengths of the fore and hind feet, which uniformly holds through all Nature, and is moſt remarkable in quadrupeds. Man's feet are larger, and likewiſe ſooner formed, than his hands. The greateſt part of the horſe's hind-leg is only a foot, being compoſed of bones correſponding to the tarſus, metatarſus, &c. It is not, therefore, ſurpriſing, that this foot ſhould be ſooner expanded than the fore-leg, the inferior part of which repreſents the hand, being compoſed of the bones of the carpus, metacarpus, &c. This difference

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is eaſily perceived immediately after a foal is brought forth. The fore-legs, when compared with the hind ones, are proportionably much ſhorter than they are to be afterwards. Beſides, the thickneſs which the body acquires, though independent of the proportional growth in length, increaſes the diſtance between the hind-feet and the head, and, conſequently, prevents the animal, when full grown, from reaching the head.

In all animals, each ſpecies varies according to the climate; and the general reſults of theſe varieties conſtitute different races. Of theſe we can only diſtinguiſh the moſt remarkable, or thoſe that ſenſibly differ from each other, paſſing over the intermediate ſhades, which here, as in all the operations of Nature, are infinite. We have even augmented their number and confuſion by cheriſhing the mixture of races. If the expreſſion may be uſed, we have dealt roughly with Nature, by bringing into our climates the horſes of Aſia and of Africa. By introducing into France the horſes of every country, the primitive race cannot now be recogniſed; ſo that, to diſtinguiſh horſes, there remains only a few ſlight characters produced by the actual influence of the climate. Theſe characters would be ſtill better marked, and the differences more ſenſible, if the races of each climate were preſerved without mixture. Theſe ſmall varieties would be more apparent and leſs numerous;

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but there would be a certain number of great varieties, which every man could diſtinguiſh with eaſe. Inſtead of which, habit, and even long experience, are neceſſary to enable us to know the horſes of different countries. On this ſubject we have no light but what is derived from the books of travellers, the works of Newcaſtle, Garſault, Gueriniere, &c. and ſome remarks communicated to us by M. de Pignerolles, maſter of horſe to the King of France, and preſident of the academy of Angers.

The Arabian horſes are the moſt beautiful. They are larger, more fleſhy, and handſomer than the Barbs. But, as they are ſeldom brought into France, few obſervations have been made with regard to their perfections or defects.

Barbary horſes are more common. They have a long fine neck, not overcharged with hair, and well divided from the withers. The head is ſmall and beautiful. The ears are handſome and properly placed, the ſhoulders are light and flat. The withers are thin and well raiſed. The back is ſtraight and ſhort. The flank and ſides are round, and the belly not too large. The haunch-bones are properly concealed; the crupper is ſomewhat long, and the tail placed rather high. The thigh is well formed, and rarely flat. The limbs are fine, handſome, and not hairy. The tendon is prominent, and the foot well made; but the paſtern is often long. They are of all colours, but generally grayiſh. In their

 movements,

movements, they are apt to be carelefs, and require to be checked. They are fwift, nervous, light, and make extremely fine hunters. Thefe horfes appear to be the moft proper for improving the breed. Their ftature, however, is not fo large as could be wifhed. They are feldom above four feet eight inches, and never exceed four feet nine *. It is confirmed by repeated experience, that, in France, England, &c. they produce foals which grow larger than their parents. Of the Barbary horfes, thofe of the kingdom of Morocco are faid to be the beft, and next to thefe are the Barbs from the mountains. The horfes of Mauritania are of an inferior quality, as well as thofe of Turkey, Perfia, and Armenia. All the horfes of warm climates have fmoother and fhorter hair than thofe of other countries. The Turkifh horfes are not fo well proportioned as the Barbs. Their necks are generally flender, their bodies long, and their legs too thin. They are however excellent travellers, and have a long wind. It will not be thought furprifing, that the bones of animals are harder in warm than in cold climates. It is for this reafon that, though they have thinner fhank bones than the horfes of this country, their limbs are ftronger.

The Spanifh horfes, which hold the fecond rank after the Barbs, have a long, thick, hairy neck. The head is rather grofs and flefhy. The ears are

* Fourteen hands and a half.

long,

long, but well ſituated. The eyes are full of fire, and their air is bold and noble. The ſhoulders are thick, and the cheſt broad. The reins are often a little low, the ſides round, and the belly frequently too big. The crupper is generally round and large, though in ſome it is rather long. The limbs are fine and not hairy; the tendons of the legs are prominent; the paſtern is ſometimes too long, like that of the Barb; the foot is rather long, like that of the mule; and the heel is often too high. The Spaniſh horſes of the beſt race are thick, plump, and of a low ſtature. Their movements are likewiſe quick and ſupple; and they are remarkable for ſpirit and boldneſs. Their colour is commonly black, or a dark cheſnut, though they are to be found of all colours. Their noſes and limbs are ſeldom white. Theſe marks are diſliked by the Spaniards, who never breed from thoſe which have ſuch characters. Their favourite mark is a ſtar in the fore-head; and they eſteem a horſe without a ſingle ſpot, as much as we deſpiſe him. Both of theſe prejudices, though oppoſite to each other, are perhaps equally ill founded; for we find excellent horſes with all kinds of marks, or with no marks whatever. Theſe little differences in the coats of horſes ſeem to have no dependence on their diſpoſitions or internal conſtitution, but take their riſe from external circumſtances *; for a ſlight wound

* This is, perhaps, not altogether true; for it is generally remarked,

wound on the ſkin produces a white ſpot. Beſides, Spaniſh horſes, of whatever kind, are all marked in the thigh, with the ſignature of the ſtud from which they were taken. They are generally of a ſmall ſtature, though ſome of them are four feet nine or ten inches *. Thoſe of Upper Andaluſia, are ſaid to be the beſt, though their heads be often too long. But their other rare and excellent qualities make this fault inſignificant. They are obedient, courageous, graceful, ſpirited, and more docile than the Barbs. For theſe talents they are preferred to all the horſes of the world, for the purpoſes of war, of pomp, or of the menage.

The fineſt Engliſh horſes, in their conformation, reſemble thoſe of Arabia and Barbary, from which they originally ſprung. Their heads, however, are too large, though handſome; and their ears are too long, but well ſituated. By the ears alone, an Engliſh horſe may be diſtinguiſhed from a Barb. But the great difference lies in their ſtature; for the Engliſh horſes are much larger and plumper, being commonly four feet ten, and even five feet high †. They are of all colours, and diſtinguiſhed by every ſort of

remarked, that white or light coloured animals are not ſo ſtrong and hardy as thoſe of darker colours. It is found by experience, that thoſe legs of horſes which have much white upon them, are apteſt to ſwell and turn greaſy; and the white ſpots occaſioned by wounds ſeem to indicate a particular weakneſs in the parts.

* Fourteen hands and a half.

† 15 hands high.

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mark. They are generally ſtrong, vigorous, hardy, capable of enduring much fatigue, and excellent either for hunting or the courſe. But they want grace and docility; they are ſtiff, and have little play in their ſhoulders.

The Engliſh race-horſes are extremely fleet, and are managed with great dexterity by their riders. I cannot give a better example than by relating the ſubſtance of a letter I received from a reſpectable nobleman*, dated *London*, *Feb.* 18, 1748. Mr. Thornhill, poſt-maſter of Stilton, laid a bet, that he would ride three times the road from Stilton to London, or 215 Engliſh miles, in 15 hours. He ſet out from Stilton on the 29th day of April 1745, and, after mounting eight different horſes on the road, arrived at London in three hours fifty-one minutes. He inſtantly ſet off from London, and, having mounted only ſix horſes, he reached Stilton in three hours fifty-two minutes. For the third courſe, he uſed ſeven of the ſame horſes, and finiſhed it in three hours forty-nine minutes. So that he not only gained his bet, but, inſtead of fifteen hours, he had performed what he had undertaken in eleven hours thirty-two minutes. I ſuſpect that no example of ſuch fleetneſs was ever exhibited at the Olympic games.

The Italian horſes were formerly much handſomer than they are now; becauſe, for ſome time paſt, the breed has been neglected. However, the Neapolitan horſes are ſtill excellent for

* The Earl of Morton.

carriages.

carriages. But, in general, they have large heads and thick necks; they are alſo untractable, and, of courſe, not eaſily managed. Theſe defects are compenſated by the ſtatelineſs of their form, by their high ſpirit, and by the gracefulneſs of their motions.

The Daniſh horſes, both on account of ſize and beauty, are preferred to all others for carriages. Some of them are perfect models; but their number is ſmall: For moſt of them are not very regularly formed, having thick necks, groſs ſhoulders, backs too long and too low, and cruppers too narrow in proportion to the thickneſs of their fore parts. But they are all graceful in their movements; and, in general, they are excellent for war and for pomp. They are of all colours; and the tiger-ſpotted horſes are peculiar to Denmark.

Germany produces very fine horſes: But, though generally bred from Barbary, Turkiſh, Spaniſh, and Italian horſes, moſt of them are heavy and ſhort-winded; and therefore ill qualified for hunting or courſing. The horſes of Hungary and Tranſylvania, on the contrary, are light and nimble. To prevent their neighing in time of war, and alſo, it is ſaid, to improve their wind, the Hungarians ſlit the noſtrils of their horſes. I have never had an opportunity of aſcertaining the fact, that horſes, whoſe noſtrils are ſlit, loſe the power of neighing. But I ſhould rather imagine, that this operation only

renders their neighing more feeble. It is remarked of the Hungarian, Croatian, and Polish horses, that they are noted for retaining what is called the *mark* in their teeth till they be very old.

The Dutch horses answer very well for drawing coaches, and are commonly used in France for that purpose. The best kind are brought from the province of Friesland: Those of Bergue and Juliers are also very good. The Flemish horses are much inferior to the Dutch. Almost the whole of them have large heads, and broad feet; and their legs are subject to humours. These two last faults render them very unfit for carriages.

In France, there are horses of all kinds; but few of them are handsome. The best saddle-horses are brought from the Limosin. They resemble the Barbs, and are excellent for the chase. But they grow very slowly, require much care when young, and must not be used till they arrive at the age of eight years. There are likewise good ponies in Auvergne, Poitou, and Burgundy. But next to the Limosin, Normandy furnishes the finest horses. They are not so good for the chase; but they make better war-horses. They are plump, and soon acquire their full growth. Good coach-horses, lighter and more alert than those of Holland, are bred in Lower Normandy and Cotentin. Franche-Comté and the Boulonnois furnish us with

with very good draught-horſes. In general, the French horſes have their ſhoulders too wide, while thoſe of the Barb are too narrow.

Having deſcribed thoſe horſes with which we are beſt acquainted, we ſhall now give the relations of travellers concerning foreign horſes, of which we have little knowledge. There are good horſes in all the iſlands of the Archipelago. Among the ancients, the horſes of Crete were in high eſtimation for agility and ſwiftneſs *. However, horſes are now little uſed in that iſland, on account of the ruggedneſs of the country, which is every where mountainous and full of inequalities. The beſt horſes in theſe iſlands, and even in Barbary, are of the Arabian race. The native horſes of the kingdom of Morocco are much ſmaller than thoſe of Arabia, but very nimble and vigorous †. Mr. Shaw alledges ‡, that the breed of Egypt and of Tingitania is ſuperior to thoſe of the neighbouring countries; and yet, more than a century ago, excellent horſes were found throughout all Barbary: Theſe Barbary horſes, he ſays, never ſtumble; and they ſtand ſtill when the rider diſmounts, or drops the bridle. They walk very faſt, and gallop with great rapidity; but they are never allowed to trot or amble, theſe movements being conſidered by the natives as rude

* Deſcrip. des Iſles de l'Archipel. par Dapper, p. 462.
† L'Afrique de Marmol, tom. ii. p. 124.
‡ See Shaw's Travels.

and

and vulgar. He adds, that the Egyptian horses are superior to all others both in stature and in beauty. But these Egyptian, as well as most of the horses of Barbary, sprung originally from the Arabians, which are unquestionably the handsomest horses in the world.

According to Marmol *, or rather Leo Africanus †, whom Marmol has copied almost verbatim, the Arabian horses are descended from the wild horses in the deserts of Arabia, of which studs were formed very anciently, and which multiplied so greatly, as to spread over all Asia and Africa. They are so swift as to out-run the ostrich. The Arabs of the desert and the people of Lybia rear numbers of these horses for the chase. They never use them either in war, or for travelling. They pasture them as long as the grass remains, and, when it fails, they feed them with dates and camel's milk, which make them nervous, light, and meagre. They catch the wild horses in snares, and, when young, they eat their flesh, which they esteem as very delicate food. These wild horses are small, and commonly of an ash-colour, though some of them are white; and the hair of the mane and tail is short and crisped. Curious relations, concerning the Arabian horses, are given by other travellers ‡, of which I shall only mention some of the principal facts.

* L'Afrique de Marmol, tom. i. p. 50.

† Leo Afric. de Africæ Descript. tom. ii. p. 750.

‡ Voyage de M. de la Roque, p. 194. et l'Hist. Generale des Voyages, tom. ii. p. 626.

There

There is not an Arabian, however poor, who has not his horſes. The Arabs generally ride upon mares, having learned from experience, that mares endure fatigue, hunger, and thirſt, better than horſes. Theſe mares are ſo gentle, that, though numbers of them are often left together for whole days, they never ſtrike or do each other the ſmalleſt injury. The Turks, on the contrary, are not fond of mares; but they purchaſe from the Arabs thoſe horſes which they intend not to uſe as ſtallions. The Arabs preſerve with great care, and for an amazing length of time, the races of their horſes. They know all their alliances and genealogies *; and they diſtinguiſh

* The tranſlator here preſents the reader with an original atteſtation, ſome of which, M. D'Arvieux ſays, have been preſerved for above 500 years in the public records.

Taken before ABDORRAMAN, KADI OF ACCA.

The occaſion of this preſent writing or inſtrument is, that, at ACCA, in the houſe of Badi, legal eſtabliſhed judge, appeared in Court Thomas Uſgate the Engliſh conſul, and with him Sheikh Morad Ebn al Hajj Abdollah, Sheikh of the county of Safad; and the ſaid conſul deſired, from the aforeſaid Sheikh, proof of the race of the gray horſe which he bought of him, and he affirmed to be Monaki Shaduhi †; but he was not ſatisfied with this, but deſired the teſtimony of the Arabs who bred the horſe, and knew how he came to Sheikh Morad; whereupon there appeared certain Arabs of repute, whoſe names are undermentioned, who teſtified and declared, that the gray horſe which the conſul formerly bought of Sheikh Morad, is Monaki Shaduhi, of

† Theſe are the names of the two breeds of Arab horſes, which are reckoned pure and true, and thoſe which are of both theſe breeds by father and mother, are the moſt noble and free from baſtardy.

tinguish their races into three different classes. The first, which are of a pure and ancient race on both sides, they call nobles; the second are likewise of an ancient race, but have been degraded by vulgar alliances; and the third class consists of their common horses. The latter sell at a low price. But those of the first class, and even of the second, among which some individuals are not inferior to the nobles, are excessively dear. Mares of the noble class are never permitted to be covered but by horses of the same quality. The Arabs, by long experience, know all the races of their horses, as well as those of their neighbours. They know their

of the pure race of horses, purer than milk †; and that the beginning of the affair was, that Sheikh Saleh, Sheikh of Alsabal, bought him of the Arabs, of the tribe of al Mohammadat, and Sheikh Saleh sold him to Sheikh Morad Ebn al Hajj Abdollah, Sheikh of Safad, and Sheikh Morad sold him to the consul aforesaid; when these matters appeared to us, and the contents were known, the said gentleman desired a certificate thereof, and testimony of the witnesses, whereupon we wrote him this certificate, for him to keep as a proof thereof. Dated Friday 28 of the latter Rabi in the year 1135.

Witnesses,

Sheikh Jumat al Faliban of the Arabs of al Mohammadat.
Ali Ebn Taleb al Kaabi.
Ibrahim his Brother.
Mohammed al Adhra Sheikh Alsarifat.
Khamis al Kaabi.

† A proverbial expression.

PENNANT'S ZOOLOGY.

names,

names,° firnames, colours, peculiar marks, &c. When a family have no noble ftallions, they borrow one of a neighbour to cover their mares, which is performed in prefence of witneffes, who give an atteftation of it, figned and fealed, before the fecretary of the Emir, or fome other public perfon. This atteftation contains the names of the horfe and mare, and a complete hiftory of their pedigrees. When the mare has foaled, witneffes are again called, and another atteftation is made, including a defcription of the foal, and the day of its birth. Thefe atteftations enhance the value of their horfes, and they are always delivered to the purchafers. The fmalleft mares of this firft clafs are worth 500 crowns; and many of them fell at 1000 crowns; and even higher prices are fometimes given. As the Arabs live in tents, thefe tents ferve them likewife for ftables. The mare and her foal, the hufband and his wife and children, fleep together promifcuoufly. The infants often lie on the body, or on the neck of the mare or foal, without receiving any injury from thefe animals, which feem afraid to move, left they fhould hurt the children. Thefe mares are fo accuftomed to fociety, that they fubmit to every kind of familiarity. The Arabs never beat their mares; but treat them gently, and talk and reafon with them. They are fo careful of them as to allow them always to walk, and never fpur them, unlefs the occafion be very urgent. Hence, whenever

ever the creatures perceive the rider's heel make an approach to their ſides, they inſtantly ſet off with incredible ſwiftneſs, and leap hedges and ditches as nimbly as ſtags. If their rider chances to fall, they are ſo well trained, that they ſtop ſhort, even in the moſt rapid gallop. All the Arabian horſes are of a middle ſtature, very eaſy in their carriage, and rather meagre than fat. They are dreſſed every morning and evening with ſo much care, that not a ſpot of dirt is left on their ſkin, and their legs, mane, and tail, are waſhed. Their tails are allowed to grow long; and the comb is ſeldom uſed, to prevent the hair from being broken. During the day, they are not permitted to eat; but are watered twice or thrice. At ſun-ſet, a bag, containing about half a buſhel of barley, is paſſed over their heads, and faſtened to the neck. This bag is not removed till next morning, when the barley is entirely conſumed. In the month of March, when the graſs is good, they are turned out to paſture. This is alſo the ſeaſon in which the mares are covered; and, on theſe occaſions, water is employed in the ſame manner as in other countries. After the ſpring is paſt, the horſes are taken from the paſture; and, during the reſt of the year, they are allowed neither graſs nor hay, and rarely ſtraw, barley being their only food. At the age of a year or ten months, the Arabians cut the manes of their foals, with a view to make them grow long and buſhy.

bushy. When two years, or two years and a half old, they are mounted, having never, before that period, been either saddled or bridled. Every day, from morning to night, all the Arabian horses stand saddled at the tent-doors.

This race of horses is spread over all Barbary; and the great men among the Moors, and even among the Negroes along the rivers Gambia and Senegal, have Arabian horses of great beauty. Instead of barley or oats, they are fed with maize, reduced to a powder, which is mixed with milk, when they require to be fattened. In this warm climate, they are allowed little water *. On the other hand, the Arabian horses are dispersed over Egypt, Turkey, and perhaps Persia, where very considerable studs were formerly kept. Marc Paul † mentions one of these studs which contained ten thousand white mares; and he says, that, in the province of Balascia, there is a vast number of large nimble horses, with hoofs so hard as to require no shoes.

The Levant horses, like those of Persia and Arabia, have very hard hoofs: They are shoed, however, but with shoes extremely light and thin. In Turkey, Persia, and Arabia, the same manner of feeding and dressing horses is observed. Their litter is made of their own dung, which is first dried in the sun, to remove

* L'Hist. Generale des Voyages, tom. iii. p. 297.

† La Descript. Geog. de l'Inde, par Marc Paul, tom. i. p. 41. et liv. i. p. 21.

the disagreeable smell, and then reduced to a powder. Of this a bed is laid in the stable or tent, about four or five inches thick. This litter lasts very long; for, after being soiled, it is dried a second time in the sun, which clears it entirely from its offensive odour.

In Turkey there are Arabian, Tartarian, and Hungarian horses, beside the native horses of that country, which last are exceedingly handsome *, swift, and spirited. But they are delicate, and soon fatigued. They eat little, are easily heated, and their skin is so sensible, that they are unable to bear the friction of a comb; instead of which, they are brushed, and washed with water. These horses, though beautiful, are inferior to the Arabians, and even to those of Persia; the latter, next to the Arabians †, being the handsomest and best horses of the East. The pasture in the plains of Media, of Persepolis, of Ardebil, and of Derbent, is extremely fine; and a prodigious quantity of horses, most of which are beautiful and excellent, are raised there by order of government. Pietro della Valle ‡ prefers the common horses of Persia to the finest Neapolitan horses. They are generally of a middle stature ‖; and some of them are very small,

* Le Voyage de M. Dumont, tom. iii. p. 253.

† Les Voyages de Thevenot, tom. ii. p. 220; de Chardin, tom. ii. p. 25.; d'Adam Olearius, tom. i. p. 560.

‡ Les Voyages de Pietro della Valle, tom. v. p. 284.

‖ Voyages de Tavernier, tom. ii. p. 19

 but

but ſtrong and active*; while others exceed the ſize of the Engliſh ſaddle-horſes †. They have light heads and fine necks. Their ears are handſome and well ſituated. They have ſlender legs, fine cruppers, and hard hoofs. They are docile, ſpirited, bold, and capable of enduring great fatigue. They are extremely ſwift, and never ſtumble. They are robuſt, and ſo eaſily nouriſhed, that their only food is barley mixed with cut ſtraw; and they are grazed during ſix weeks of the ſpring only. Their tails are allowed to grow long; and they are never gelded. Coverings are uſed to defend them from the injuries of the weather. Peculiar care and attention are beſtowed upon them; and they are managed by a ſimple bridle, without employing the ſpur. Great numbers of them are tranſported to Turkey and the Indies. Thoſe travellers, who beſtow ſo much praiſe upon the Perſian horſes, allow, however, that the Arabians are ſuperior in agility, courage, ſtrength, and beauty; and that they are more valued, even in Perſia, than the horſes of that country.

The horſes which are bred in the Indies are very indifferent ‡. Thoſe uſed by the great men of the country are brought from Perſia and

* Les Voyage de Thevenot, tom. ii. p. 220.

† Les Voyages de Chardin, tom. ii. p. 25.

‡ Le Voyage de la Boullaye-le-Gouz, p. 256. et Recueil des Voyages qui ont ſervi à l'Etabliſſement de la Compagnie des Indes, tom. iv. p. 424.

Arabia.

Arabia. They are fed with hay during the day; and, at night, in place of barley and oats, they get peafe boiled with fugar and butter. This nourifhing diet fupports them, and gives them fome degree of ftrength; without it, they would foon perifh, the climate not being adapted to their conftitution. The native horfes of India are very fmall. Some of them are fo exceedingly diminutive, that Tavernier informs us, the young Prince of Mogul, aged about feven or eight years, generally rode on a handfome little creature, whofe ftature exceeded not that of a large greyhound *. Very warm climates, it would appear, are deftructive to horfes. Thofe of the Gold Coaft, or Juida, of Guiney, &c. are likewife extremely bad. They carry their head and neck very low. Their movements are fo feeble and tottering, that one is apt to imagine they are always ready to fall. If not continually beat, they would not ftir a limb; and the greateft part of them are fo fhort, that the feet of the rider almoft touch the ground †. They are, befides, very untractable, and fit only to be eaten by the Negroes, who are equally fond of horfes flefh as that of dogs ‡. This appetite for horfes flefh is common to the Negroes and Arabians, and difcovers itfelf in Tartary, and even

* Les Voyages de Tavernier, tom. iii. p. 334.

† Hift. Generale des Voyages, tom. iii. p. 228.

‡ Idem, tom. iv. p. 353.

in

in China *. The Chinese horses are as bad as those of India, being feeble, sluggish, ill made, and very small †: Those of Corea exceed not three feet in height ‡. Almost all the horses of China are gelded; and they are so timid, that they cannot be used in war. It may, indeed, be affirmed, that the Tartarian horses made the conquest of China. The horses of Tartary are very proper for the purposes of war. Though not of the largest size, they are strong, vigorous, bold, fiery, and extremely swift. Their hoofs are hard, but too narrow; their heads are light, but too small; their necks are long and stiff; and their limbs are too long. Notwithstanding these faults, they may be regarded as good horses; for they are indefatigable, and run with amazing rapidity. The Tartars, like the Arabians, live with their horses. At the age of seven or eight months, they are mounted by children, who walk and gallop them by turns. In this manner they are gradually trained; and they are accustomed to suffer long abstinence. But they are not mounted for hunting or travelling, till they arrive at six or seven years of age, when they are

* Le Voyage de M. le Gentil, tom. ii. p. 24.

† Les Anciennes Relations des Indes, & de la Chine, traduites de l'Arabe, p. 204. L'Hist. Gen. des Voyages, tom. vi. p. 492. 535. L'Histoire de la Conquéte de la Chine, par Palafox, p. 426.

‡ Nine hands.

obliged

obliged to undergo the moſt incredible fatigues*; as walking two or three days without ſtopping; receiving, for four or five days together, only a handful of herbage every eight hours; and, at the ſame time, they are kept from drinking for 24 hours, &c. Theſe horſes, which are ſo robuſt in their own country, become feeble and uſeleſs when tranſported to China or the Indies: But they thrive very well in Perſia and Turkey. In Little Tartary, there is a race of ſmall horſes, of which the natives are ſo fond, that they never permit theſe horſes to be ſold to ſtrangers. They poſſeſs all the good and bad qualities peculiar to the horſes of Great Tartary; which ſhows, that the influence of the ſame manners and education create, in theſe animals, the ſame diſpoſitions and temperament. In Circaſſia and Mingrelia, there are many horſes ſtill handſomer than thoſe of Tartary. Fine horſes are alſo to be found in the Ukraine, in Walachia, in Poland, and in Sweden. But we have no particular information concerning their excellencies or defects.

If we conſult the ancients as to the qualities of horſes in different countries, we ſhall find †, that the Greek horſes, and eſpecially thoſe of Theſſaly and Epirus, were in high eſtimation, and were excellent for the purpoſes of war;

* Palafox, p. 427. Le Recueil des Voyages du Nord. tom. iii. p. 156. Tavernier, tom. i. p. 472. L'Hiſt. Gen. des Voyag. tom. vi. p. 603. et tom. vii. p. 214.

† Aldrovand. Hiſt. Nat. de Soliped. p. 48. &c.

that thoſe of Achaia were the largeſt then known; that the handſomeſt came from Egypt, where they were very numerous, and where Solomon ſent to purchaſe them at a very high price; that, in Ethiopia, on account of the great heat of the climate, the horſes did not thrive; that Arabia and Africa furniſhed the handſomeſt, lighteſt, and beſt horſes, either for travelling or for the courſe; that thoſe of Italy, and particularly of Apulia, were likewiſe very good; that Sicily, Cappadocia, Syria, Armenia, Media, and Perſia, produced excellent horſes, which were remarkable for lightneſs and fleetneſs; that thoſe of Sardinia and Corſica were ſmall, but bold and vivacious; that the horſes of Spain reſembled thoſe of Parthia, and excelled in war; that, in Tranſylvania and Walachia, there were ſwift horſes, with light heads, long manes which hang down to the ground, and buſhy tails; that the Daniſh horſes were handſome, and fine leapers; that thoſe of Scandinavia were ſmall, but well-formed, and very agile; that the horſes of Flanders were remarkable for ſtrength; that the Gauls furniſhed the Romans with good horſes for the purpoſes of riding and carrying burthens; that the German horſes were ill-formed, and ſo vicious, that no uſe was made of them; that the horſes of Switzerland were numerous, and uſeful in war; that thoſe of Hungary were alſo very good; and, laſtly, that the Indian horſes were ſmall and very feeble.

From

From all these facts, it is apparent, that the Arabian horses have always been, and still are, the best horses of the world, both for beauty and goodness; that from them, either directly, or by the mediation of the Barbs, are derived the finest horses in Europe, in Africa, and in Asia; that Arabia is, perhaps, not only the original climate of horses, but the best suited to their constitution; since, instead of crossing the breed by foreign horses, the natives anxiously preserve the purity of their own race; that, at least, if Arabia be not the best climate for horses, the Arabs have produced the same effect, by the scrupulous and perpetual attention they have paid towards ennobling the race, and never permiting individuals to mix which were not the most handsome, and of the finest quality; and that, by the same attention, continued for ages, they have improved the species far beyond what Nature would have performed in the most favourable climate. It may still farther be concluded, that climates rather warm than cold, and above all, dry countries, are best adapted to the nature of horses; that, in general, the small are better than the large horses; that care is equally necessary to them as food; that, by familiarity and caresses, we procure more advantage from them, than by force and chastisement; that the horses of warm countries have their bones, hoofs, and muscles, more firm and compact than those of our climates; that, though heat is more con-

formable

formable to the nature of theſe animals than cold, yet exceſſive heat is exceedingly hurtful to them; that exceſſive cold is not leſs injurious; and, in fine, that their conſtitution and diſpoſitions depend almoſt entirely upon climate, food, care, and education.

The practice of gelding horſes, ſo generally diffuſed over Europe and China, is unknown in Perſia, Arabia, and many other parts of the eaſt. This operation greatly diminiſhes their ſtrength, courage, ſprightlineſs, &c.; but it endows them with gentleneſs, tranquillity, and docility. In performing it, the animal is thrown on his back, by means of ropes fixed to his legs; the ſcrotum is opened with a ſharp knife; and the teſtes, with their veſſels, and the ligaments which ſupport them, are removed. The wound is then cloſed up; and the patient is bathed twice a day with cold water. His food, during this period, conſiſts of bran drenched in water, with a view to cool him. The operation ſhould be performed in ſpring or autumn, much heat or much cold being equally dangerous. With regard to the age at which it ſhould be executed, the practice differs in different places. In certain provinces of France, horſes are gelded at the age of a year or eighteen months, or as ſoon as the teſtes are very apparent without the body. But the moſt general and moſt rational cuſtom is to delay the operation till the age of two or three years; becauſe when protracted this long, the animal

animal retains more of the qualities peculiar to the male ſex. Pliny ſays, that, if a horſe be gelded before he loſes his milk-teeth, they never ſhed. But I know, from repeated obſervation, that this remark is falſe. The ancients, it is probable, were led into this error, by an analogy drawn from the ſtag, roe-buck, &c.; for the horns of theſe animals never fall off after caſtration. Geldings loſe the power of impregnating; but there are many examples of their being ſtill able to copulate.

Horſes of all colours, like moſt animals covered with hair, moult or caſt their hair every year, commonly in the ſpring, and ſometimes in autumn. As they are then weaker than at any other period, they require more care, and ſhould be more plentifully fed. Some horſes likewiſe caſt their hoofs, eſpecially in moiſt and marſhy countries, as in Holland *.

Mares and geldings neigh leſs frequently than perfect horſes. Their voices are alſo neither ſo full nor ſo deep. In horſes of every kind, five different ſpecies of neighing, expreſſive of different paſſions, may be diſtinguiſhed. In the neigh proceeding from joy, the voice is long protracted, and begins and terminates with ſharp ſounds: The horſe, at the ſame time, flings, but without any inclination to ſtrike. In the

* If this aſſertion be true, the caſting of the hoofs muſt proceed from ſome morbid cauſe; for no horſes caſt their hoofs, unleſs when diſeaſed.

neigh

neigh of desire, whether from love or friendship, the horse does not fling, the voice is long continued, and finishes with graver sounds. The neigh of anger, during which the animal flings and strikes with fury, is very short and sharp. The neigh of fear, during which he also flings, is not longer than that of anger; the voice is grave and hoarse, and seems as if it proceeded entirely from the nostrils. This neigh resembles the roaring of a lion. The noise expressive of pain is not so much a neigh, as a groan or snorting uttered with a grave voice, and following the alternate motions of respiration. It has likewise been remarked, that horses which neigh most frequently from motives of joy or desire, are the best and most generous. The voice of unmutilated horses is stronger than that of geldings or mares. The female voice, even from the moment of birth, is weaker than that of the male. At two years, or two and a half, which is the age of puberty, the voice both of males and females, as in man and other animals, becomes stronger and more grave.

When the horse is fired with love, he shows his teeth, and has the appearance of laughing. He likewise shows them when angry and inclined to bite. He sometimes thrusts out his tongue to lick, but less frequently than the ox, though the latter is less sensible of caresses. The horse remembers injuries much longer than the ox, and is also more easily dispirited. His natural

tural diſpoſition, which is bold and impetuous, makes him exert his whole force at once; and, when he perceives that ſtill more is requiſite, he grows indignant, and obſtinately refuſes to act. But the ox, who is naturally ſlow and ſlothful, ſeldom employs his whole ſtrength, and is not ſo eaſily diſheartened.

The horſe ſleeps much leſs than man. When in good health, he never lies above two or three hours at a time. He then riſes to eat. After being much fatigued, and after filling his belly, he lies down a ſecond time. But, upon the whole, he ſleeps not above three or four hours in the twenty-four. There are alſo ſome horſes which never lie down, but ſleep ſtanding; and even thoſe which are accuſtomed to lie down, ſometimes ſleep on their feet. It has been remarked, that geldings ſleep oftener and longer than perfect horſes.

All quadrupeds drink not in the ſame manner, though all are under an equal neceſſity of exploring with the head that liquor which they have no other method of apprehending, except the monkey, and ſome other animals that have hands, and can drink like man, when a proper veſſel is preſented to them; for they carry it to their mouth, pour out the liquor, and ſwallow it by the ſimple movement of deglutition. This is the ordinary way in which man drinks, becauſe it is the moſt commodious. But he can vary his method of drinking, by contracting

the lips, and ſucking the fluid, or rather by ſinking both mouth and noſe into it, and then performing the motions neceſſary to ſwallowing. He can even ſeize a fluid by the ſimple motion of his lips; or, laſtly, he can ſtretch out and expand his tongue, make a kind of little cup of it, and in this manner, though with ſome difficulty, ſatisfy his thirſt. Moſt quadrupeds might alſo drink in different ways: But, like man, they follow that which is moſt convenient. The dog, whoſe mouth opens wide, and whoſe tongue is long and ſlender, drinks by lapping, or licking, with his tongue, which he forms into a kind of cup or ſcoop, fills at each time, and thus carries a ſufficient quantity of fluid into his mouth. This method he prefers to that of dipping his noſe into the water. The horſe, on the contrary, whoſe mouth is too ſmall, and whoſe tongue is too thick and too ſhort, for forming a ſcoop, and who, beſides, drinks with more avidity than he eats, briſkly ſinks his mouth and noſe deep into the water, which he ſwallows plentifully by the ſimple motion of deglutition *. But this obliges him to drink without drawing his breath; while the dog reſpires at his noſe during the time he is drinking. After running, when the reſpiration is ſhort and laborious, horſes ſhould

* This is not always the caſe; for many horſes touch only the ſurface of the water with their lips, and ſuck it gently in; and even thoſe which dip their noſes deeper, never ſink the noſtrils under the water, but breathe freely through them when drinking.

be

be allowed to drink at leiſure, and to breathe as often as they incline. Neither ſhould they be permitted to drink water that is too cold; for, independent of the colics frequently occaſioned by very cold water, it often cools their noſe to ſuch a degree, as brings on rheums, and perhaps lays the foundation of the diſeaſe called *glanders*, the moſt obſtinate of all maladies to which this noble animal is ſubject. It has lately been diſcovered, that this diſeaſe is ſeated in the pituitary membrane*, and that it is a genuine rheum, which in time produces an inflammation in that membrane. Beſides, thoſe travellers who give a detail of the diſeaſes of horſes in warm countries, alledge not that the glanders is equally frequent in Arabia, Perſia, and Barbary, as in cold climates. Hence I am led to conjecture, that this malady is owing to the ſuperior coldneſs of the water; becauſe theſe animals are obliged to keep their noſes in the water a conſiderable time, which might be prevented by never allowing them to drink very cold water, and by always drying their noſtrils after drinking. Aſſes, which dread cold more than horſes, and reſemble them ſo greatly in their internal ſtructure, are not equally ſubject to the glanders, which is owing, perhaps, to their drinking in a different manner from the horſe; for, inſtead of ſinking the noſe into the water, they barely touch it with their lips.

* M. de la Foſſe, farrie[illegible] King, firſt demonſtrated this fact; and he has attempted to cure horſes by the trepan.

I ſhall mention no more of the diſeaſes of horſes. It would extend Natural Hiſtory beyond all bounds, if, to the hiſtory of each animal, we were to join that of its diſeaſes. However, I cannot finiſh the hiſtory of the horſe, without regretting that the health of this uſeful and valuable animal ſhould be ſtill abandoned to the blind care, and often abſurd and cruel practice, of a ſet of men who have neither understanding nor letters. Of the art, called by the ancients Medicina Veterinaria, we now hardly know more than the name. If any phyſician would turn his views to this ſubject, and make it a principal object of his inquiry, I am convinced that he would be amply rewarded for his trouble; and that he would not only acquire a fortune, but obtain the higheſt reputation. This ſpecies of the medical art would by no means be conjectural, or ſo difficult as the other. The manners, the food, the influence of ſentiment, and all the other cauſes of diſorders, being leſs complicated in theſe animals than in man, their diſeaſes muſt alſo be more ſimple, and, of courſe, more eaſily inveſtigated and treated with ſucceſs. To theſe advantages may be added the perfect liberty of making experiments, of trying new remedies, and of arriving, without fear or reproach, to a moſt extenſive knowledge of this kind, from which, by analogy, deductions might be drawn of the greateſt utility to the art of curing men.

SUPPLEMENT.

WE have already deſcribed the manner in which the horſes of Arabia are treated, and given a detail of the pains and attention beſtowed on their education. This dry and warm country, which appears to be the original climate of the horſe, and moſt conformable to his nature, permits or requires a number of uſages that cannot be practiſed, with equal effect, in any other region. In France, and other northern nations, it is impracticable to train and feed horſes in the ſame way as in warm climates. But men, who are intereſted in theſe uſeful creatures, will not be diſpleaſed to learn how they are managed in countries leſs favoured by Heaven than Arabia, and how they conduct themſelves, when they act independent of the human ſpecies, and when left entirely to their own diſpoſitions and inſtincts.

Horſes are differently fed, according to the different countries to which they are tranſported, and the uſes to which they are deſtined. The horſes of Arabia or Barbary, which are deſtined for hunting, ſeldom eat herbage or grain. Their common food, which conſiſts of dates and camels milk, is given them every morn-

ing and evening. These aliments, instead of fattening the horses, render them meagre, nervous, and very fleet. They spontaneously suck the she-camels, whom they follow * till the time they are ready for mounting, which is not before the age of six or seven years.

In Persia, the horses are exposed night and day to the open air. But, to protect them from the injuries of the weather, from damp vapours, and from rain, they are covered, especially in winter, with cloths; and sometimes an additional covering is added, which is made of hair, and very thick. A spot of dry level ground is prepared for them, which is greater or smaller according to their number, and kept extremely clean. Here they are all tied to a long rope, which is well stretched, and firmly fixed at each end to two iron rods stuck in the earth. Their halters, however, are sufficiently free to allow them to move with ease. To prevent them from hurting each other, their hind-legs are tied with a rope, which has iron buckles at each extremity; these are brought about to the fore part of the horses, and fastened to the ground by pegs, but loose enough to allow them to lie down or to rise at their pleasure. When put into stables, they are managed in the same manner. Xenophon informs us, that this practice was observed in his days; and it is alledged, that, by this means, the animals are rendered

* Voyage de Marmol, tom. i. p. 50.

more gentle and tractable, and less peevish among themselves; qualities extremely useful in war, when vicious horses, tied up in squadrons, often injure one another. For litter, the Persians use only sand or dry dust, upon which their horses lie down and sleep as well as if it were straw *. In other countries, as Arabia and the Mogul empire, the horses are littered with their own dung, well dried and reduced to a powder †. The eastern horses are never allowed to eat from the ground, or even from a rack; but are served with barley and cut straw in pocks tied to their heads; for in these climates no hay is made, nor do the natives cultivate oats. In spring, the horses are fed with grass or green barley, and great care is taken to give them as much only as is barely necessary; for too much nourishment makes their legs swell, and soon renders them useless. These horses, though ridden without bridle or stirrups, are easily managed. They carry their heads very high, by means of a simple snaffle, and run with great rapidity and sureness upon the worst roads. The whip and spur are very seldom employed. The latter, when used, consists only of a single point fixed to the heel of the boot. Their common whips are made of small strips of parchment knotted and twisted. A few lashes with this whip are sufficient for every purpose of the rider.

* Voyage della Valle, tom. v. p. 284.
† Thevenot, tom. iii. p. [illegible]

Horses are so numerous in Persia, that, though excellent, they sell cheap. Some of them are very tall and heavy; but all of them are more remarkable for strength, than for gracefulness and beauty. For easy travelling, the Persians use pacing horses, which are taught this motion by tying the fore-foot to the hind-foot on the same side: When young, their nostrils are slit, from a notion that it makes them breathe more freely. These horses travel so well, that they perform with ease a journey of eight leagues without stopping *.

But Arabia, Barbary, and Persia, are not the only climates which produce good and handsome horses. Even in the coldest countries, if not too moist, these animals succeed better than in very warm climates. The beauty of the Danish horses, and the excellence of those of Sweden, Poland, &c. are universally known. In Iceland, where the cold is excessive, and where often no other food can be had than dried fishes, the horses, though small, are extremely vigorous †; some of them are indeed so diminutive as to be fit for carrying children only ‡. Besides, they are so plentiful in this island, that the shepherds tend their flocks on horseback. Their number is not expensive; for their food costs almost nothing. Such as the owners can apply to no immediate use, they mark, and turn out to the mountains.

* Della Valle, tom. v. p. 284. † Recueil des Voyages du Nord, tom. i. p. 18. ‡ Anderson's Description of Iceland, p. 79.

There they ſoon become wild; and, when wanted, are hunted in troops, and caught with long ropes. When the mares foal in the mountains, the proprietors put their peculiar marks on the young, and leave them there for three years. Thoſe horſes which are brought up in the mountains, are generally more handſome, bold, and fleet, than thoſe reared in ſtables *.

The Norwegian horſes are likewiſe ſmall, but well proportioned. Moſt of them are yellow, with a black line running the whole length of the back. Some of them are of a cheſnut, and others of an iron-gray colour. Theſe horſes are very ſure footed, travel with great caution through the rough paths of the mountains, and ſlide down ſteep declivities, by bringing their hind-feet under their bellies. They defend themſelves againſt the aſſaults of the bear. When a ſtallion, in company with mares or foals, perceives this voracious animal, he makes them ſtay behind, approaches, and boldly attacks the enemy, whom he beats with his fore-feet, and generally kills. But, if the horſes attempt to defend themſelves by ſtriking with their hind-feet, they are infallibly gone; for the bear leaps upon their backs, where he ſticks with ſuch force that he ſuffocates them in a ſhort time †.

The horſes of Nordland never exceed four feet and a half in height ‡. The nearer we ap-

* Hiſt. Gen. des Voyag. tom. xviii. p. 19.
† Pontoppidan, Hiſt. Nat. of Norw. [illegible] 12 1-half hands.

 proach

proach to the pole, we find that horſes become ſmaller or weaker. Thoſe of Weſt Nordland are of a ſingular form. They have large heads and eyes, ſhort necks, large poitrels, narrow withers, long thick bodies, ſhort loins; the upper part of their legs is long, and the under ſhort and naked; their hoofs are ſmall and hard; their tails and manes are large and buſhy; and their feet are ſmall, but ſure, and never defended with ſhoes. Theſe horſes are good, ſeldom reſtive or ſtubborn, and climb with patience the higheſt mountains. The paſture in Nordland is ſo excellent, that, when horſes are brought from thence to Stockholm, they ſeldom remain above a year without loſing their fleſh and their vigour. On the contrary, when horſes are carried from more northern countries to Nordland, though ſickly for the firſt year, they recover their ſtrength *.

Exceſs of heat or of cold ſeems to be equally hoſtile to the ſtature of horſes. The Japaneſe horſes are generally ſmall, though ſome of them are of a tolerable ſize. The latter probably come from the mountains of that country. The ſame remark applies to the horſes of China. We are aſſured, however, that thoſe of Tonquin are nervous, of a good ſize, gentle, and eaſily trained to any kind of exerciſe †.

* Hiſt. Gen. des Voyag. tom. xix. p. 561.

† Hiſt. de Tonquin, par le P. de Rhodes, p. 51.

It is well known, that horſes bred in dry warm climates degenerate, and even cannot live, in moiſt countries, however warm. But they ſucceed very well in all the mountainous countries of our continent, from Arabia to Denmark and Tartary, and, in America, from New Spain to the land of Magellan. It is, therefore, neither heat nor cold, but moiſture alone, that is noxious to theſe animals.

There were no horſes in America when it was diſcovered. But, in leſs than two centuries after a ſmall number of them had been tranſported thither from Europe, they multiplied ſo prodigiouſly, eſpecially in Chili, that they ſold at very low prices. Frezier remarks, that this great increaſe was ſtill more ſurpriſing, becauſe the Indians eat horſes, and kill many of them by fatigue and bad management *. The horſes carried by the Europeans to the moſt eaſtern parts of our continent, as the Philippine iſlands, have likewiſe multiplied exceedingly †.

In the Ukraine ‡, and among the Coſſacks along the river Don, the horſes live wild in the fields and foreſts. In that large and thinly

* Voyage de Frezier dans la Mer Sud, p. 67.

† Voyage de Gemelli Careri, tom. v. p. 162.

‡ There are horſes in the Ukraine which go in troops of five or ſix hundred. They are fit for no ſervice, but make good eating. Their fleſh is agreeable, more tender than veal, and the natives eat it with pepper. The old horſes are fattened for the market, and are ſold to the Tartars as dear as beef or mutton; *Deſcript. de l'Ukraine, par Beauplan.*

peopled country comprehended between the Don and the Nieper, the horfes go in troops of three, four, or five hundred, and have no fhelter even when the ground is covered with fnow, which they remove with their fore-feet in queft of food. Thefe troops are guarded by two or three men on horfeback; and it is only in fevere winters that they are lodged for a few days in the villages, which, in this country, are very diftant from each other. Thefe troops of horfes give rife to fome remarks, which feem to prove that men are not the only animals that live in fociety, and obey, by compact, the commands of one of their own number. Each of thefe troops has a chief whom the individuals implicitly obey; he directs their courfe, and makes them proceed or ftop at his pleafure. This chief likewife gives orders for the neceffary arrangements and motions, when the troop is attacked by robbers or by wolves. He is extremely vigilant and alert: He frequently runs round the troop; and, when he finds any horfes out of their rank, or lagging behind, he gives them a pufh with his fhoulder, and obliges them to take their proper ftations. Thefe animals, without being mounted or conducted by men, march nearly in as good order as our trained cavalry. Though at perfect liberty, they pafture in files and brigades, and form different companies, without ever mixing or feparating. The chief occupies this important and fatiguing office for four or five years. When

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he becomes weaker and lefs active, another horfe, ambitious of command, and who feels his own ftrength, fprings out from the troop, attacks the old chief, who, if not vanquifhed, keeps his command; but, if beat, enters with fhame into the common herd; and the conqueror takes the lead, is recognifed as fovereign, and obeyed by the whole troop *.

In Finland, when the fnows are diffolved in the month of May, the horfes depart from their mafters, and go into certain diftricts of the forefts, as if they had previoufly fixed a rendezvous. There they form different troops, which never feparate or intermix. Each troop takes a different diftrict of the foreft for pafturing. To this territory they confine themfelves, and never encroach on the lands belonging to other troops. When the grafs is exhaufted, they decamp, and take poffeffion of a frefh pafturage in the fame order as before. The police of their fociety is fo well regulated, and their marches fo uniform, that their owners always know where to find their horfes, when they have occafion for them; and thofe which are carried off, after having performed their tafk, return, of their own accord, to their companions in the woods. In the month of September, when the weather turns bad, they quit the foreft, march

* Extract from a Memoir communicated to M. de Buffon, by M. Sanchez, formerly chief phyfician to the Ruffian army.

home

home in troops, and each takes poſſeſſion of his own ſtable.

Theſe horſes are ſmall, but good and ſpirited, without being vicious. Though generally very docile, ſome of them reſiſt, when their owners offer to take them, or to yoke them in carriages. When they return from the foreſts, they are fat and in fine order. But the perpetual labour they undergo during the winter, and the ſmall quantity of food they receive, ſoon make them loſe their fleſh. They roll on the ſnow as other horſes do on the graſs. They paſs the night indifferently, either in the court yard or in the ſtable, even during the moſt violent froſts *.

Theſe horſes, which live in troops, and are often removed from the dominion of man, form the link or ſhade between domeſtic and wild horſes. Of the latter there are ſome in the iſland of St. Helena, which, after being tranſported thither from Europe, became ſo ſavage and ferocious, that, rather than ſuffer themſelves to be taken, they would leap over the higheſt precipices into the ſea †. In the environs of Nippes, ſome of them are not larger than aſſes; but they are rounder, and well proportioned. They are vivacious, indefatigable, and poſſeſs a ſtrength and dexterity beyond what could be expected. In Saint Domingo, the horſes are of a middle ſtature, and much eſteemed. Numbers

* Journ. d'un Voyag. au Nord, par M. Outhier.

† Mem. pour ſervir a l'Hiſtoire des Indes Orientales, p. 199.

of them are taken with ſnares and ropes; but moſt of theſe continue to be extremely reſtive and ſkittiſh *. There are alſo horſes in Virginia, which, though ſprung from the domeſtic kind, have become ſo ferocious in the woods, that it is difficult to approach them, and, when taken, they belong to the perſon who apprehends them. They are commonly ſo ſtubborn that it is not eaſy to tame them †. In Tartary, and particularly in the country between Urgenz and the Caſpian ſea, birds of prey are employed in hunting wild horſes. Theſe birds are trained to ſeize the horſe by the neck and head, who fatigues himſelf by running, but is unable to diſengage himſelf ‡ from his tormentor. The wild horſes in the country of the Mongous and Kakas Tartars, differ not from thoſe which are tame. They are found in great numbers upon the weſtern coaſt; and ſome appear in the country of the Kakas which borders on the *Harni*. Theſe wild horſes are ſo ſwift, that they often eſcape the arrows of the moſt dexterous hunters. They march in numerous troops; and, when they chance to meet with tamed horſes, they ſurround them and oblige them to fly §. In Congo, conſiderable numbers of wild horſes are ſtill to be found ‖. They are ſometimes

* Nouveau Voyag. aux Iſles de l'Amerique, tom. v. p. 192.
† Hiſt. de la Virginia, p. 406.
‡ Hiſt. Gen. des Voyag. tom. viii. p. 156. § Ib. tom. vi. p. 602. ‖ Il Genio vagante del Conte Aurelio degli Auzi, tom. ii. p. 475.

ſeen

ſeen alſo in the environs of the Cape of Good Hope; but they are ſeldom taken, becauſe the inhabitants prefer the horſes tranſported from Perſia *.

When formerly treating of the horſe, I remarked, that, from all the obſervations of the breeders of horſes, the male appeared to have greater influence upon the offspring than the female; and I then gave ſome reaſons which rendered the univerſality of this fact doubtful, and even made it probable that the influence of the male and female were equal. But numerous experiments and obſervations have now convinced me, that, not only in horſes, but in man and every other animal, the male has more influence on the external form of the young than the female, and that, in every ſpecies, the male is the principal type of the race.

I have ſaid †, that, in the common order of Nature, it is not the males, but the females, which conſtitute the unity of the ſpecies: But this prevents not the male from being the true type of each ſpecies; and, what I have advanced concerning unity, ought to be extended only to the greater facility of repreſenting the ſpecies poſſeſſed by the female, though ſhe ſubmits to the embraces of different males. This point I have fully diſcuſſed in my hiſtory of birds ‡,

* Deſcription du Cap, par Kolbe, tom. iii. p. 20.
† See below, vol. viii. art. Degeneration of Animals.
‡ Hiſt. Nat. des Oiſeaux, tom. iv.

and,

and, in the preſent work, under the article *Mule*; from which it appears, that, though the female ſeems to have more influence upon the ſpecific character of the breed, ſhe never improves it, the male alone enjoying the faculty of ſupporting the purity of the race, and of rendering it more perfect.

THE ASS*.

THIS animal, even when examined with minute attention, has the appearance of a degenerated horſe. The exact ſimilarity in the ſtructure of the brain, lungs, ſtomach, inteſtinal canal, heart, liver, and other viſcera, and the great reſemblance of the body, legs, feet, and whole ſkeleton, ſeem to ſupport this opinion. The ſlight differences which take place between theſe two animals may be attributed to the long continued influence of climate and food, and to a fortuitous ſucceſſion of many generations of ſmall wild horſes, who, by gradually degenerating, at laſt produced a new and permanent ſpecies, or rather a race of ſimilar individuals, all marked with the ſame defects, and differing ſo widely from the genuine horſe, as to be regarded as conſtituting a new ſpecies. The greater variety of the colour of horſes than of aſſes appears to favour this idea: This circumſtance ſhows that the former have been longer in a do-

* The aſs has long ſlouching ears and a ſhort mane. The tail is covered with long hairs at its termination only; and the body is [illegible] colour, with a black bar croſs the ſhoulders. His hoof conſiſts of one piece; and he has ſix cutting teeth in each jaw.

meſtic

meſtic ſtate; for the colour of all domeſtic animals varies much more than that of wild ones of the ſame ſpecies. Beſides, the wild horſes mentioned by travellers are generally ſmall, and have, like the aſs, gray hair, and a naked tail, tufted at the extremity. Some wild, as well as domeſtic horſes, have likewiſe a black line on the back, and other characters which make them nearly approach to the aſs.

On the other hand, if we attend to the differences of temperament, diſpoſitions, manners, and, in a word, of the general reſult of the organization of theſe two animals, particularly the impoſſibility of their commixture, ſo as to form a common, or even an intermediate ſpecies, capable of procreating, the opinion, that they were originally diſtinct ſpecies, equally removed from each other as at preſent, will appear to be the moſt probable. The aſs, beſides, differs materially from the horſe, in ſmallneſs of ſtature, thickneſs of the head, length of the ears, hardneſs of the ſkin, nakedneſs of the tail, the form of the buttocks, and the dimenſions of the adjacent parts, the voice, the appetite, the manner of drinking, &c. Is it poſſible that animals ſo eſſentially different, ſhould ſpring from the ſame original ſtock? Are they, to uſe the language of nomenclators*, of the ſame family? Or rather,

* Equus cauda undique ſetoſa, the horſe; equus cauda extremitate ſetoſa, cruce nigra ſupra humeros, [illegible] Syſt. Nat. Claſſ. 1. ord. 6.

are

are they not, and have they not always been, diſtinct animals?

Philoſophers will perceive the extent, the difficulties, and the importance of this queſtion, which we ſhall here diſcuſs, only becauſe it for the firſt time occurs. It relates to the production of beings, and, for its illuſtration, requires that we ſhould conſider Nature under a new point of view. If, from the immenſe number of animated beings which people the univerſe, we ſelect a ſingle animal, or even the human body, as a ſtandard, and compare all other organized beings with it, we ſhall find that each enjoys an independent exiſtence, and that the whole are diſtinguiſhed by an almoſt infinite variety of gradations. There exiſts, at the ſame time, a primitive and general deſign, which may be traced to a great diſtance, and whoſe degradations are ſtill ſlower than thoſe of figure or other external relations: For, not to mention the organs of digeſtion, of circulation, or of generation, without which animals could neither ſubſiſt nor reproduce, there is, even among the parts that contribute moſt to variety in external form, ſuch an amazing reſemblance as neceſſarily conveys the idea of an original plan upon which the whole has been conceived and executed. When, for example, the parts conſtituting the body of a horſe, which ſeems to differ ſo widely from that of man, are compared in detail with the human frame, inſtead of being ſtruck with the difference,

ence, we are aſtoniſhed at the ſingular and almoſt perfect reſemblance. In a word, take the ſkeleton of a man, incline the bones of the pelvis, ſhorten thoſe of the thighs, legs, and arms, lengthen the bones of the feet and hands, join the phalanges of the fingers and toes, lengthen the jaws by ſhortening the frontal bone, and, laſtly, extend the ſpine of the back: this ſkeleton would no longer repreſent that of a man, but would be the ſkeleton of a horſe; for, by lengthening the back-bone and the jaws, the number of vertebræ, ribs, and teeth, would likewiſe be augmented; and it is only by the number of theſe bones, which may be regarded as acceſſory, and by the prolonging, contracting, or junction of others, that the ſkeleton of a horſe differs from the ſkeleton of a man. But, to trace theſe relations more minutely, let us examine ſeparately ſome parts which are eſſential to the figure of animals, as the ribs: Theſe we find in man, in all quadrupeds, in birds, in fiſhes, and the veſtiges of them are apparent even in the ſhell of the turtle: let us next conſider, that the foot of a horſe, ſo ſeemingly different from the hand of a man, is, however, compoſed of the ſame bones, and that, at the extremity of each finger, we have the ſame ſmall bone, reſembling a horſe-ſhoe, which bounds the foot of that animal. From theſe facts we may judge whether this hidden reſemblance is not more wonderful than the apparent differences; whe-

ther this conſtant uniformity of deſign, to be traced from men to quadrupeds, from quadrupeds to the cetaceous animals, from the cetaceous animals to birds, from birds to reptiles, from reptiles to fiſhes, &c. in which the eſſential parts, as the heart, the inteſtines, the ſpine, the ſenſes, &c. are always included, does not indicate, that the Supreme Being, in creating animals, employed only one idea, and, at the ſame time, diverſified it in every poſſible manner, to give men an opportunity of admiring equally the magnificence of the execution and the ſimplicity of the deſign?

In this view, not only the horſe and aſs, but man, monkeys, quadrupeds, and every ſpecies of animal, may be conſidered as one family. But from this are we warranted to conclude, that, in this great and numerous family, which were brought into exiſtence by the Almighty alone, there are leſſer families conceived by Nature, and produced by time, of which ſome ſhould only conſiſt of two individuals, as the horſe and aſs, others of ſeveral individuals, as the weaſel, the ferret, the martin, the pole-cat, &c.; and, at the ſame time, that, among vegetables, their are families conſiſting of ten, twenty, thirty, &c. plants? If theſe families really exiſted, they could only be produced by the mixture and ſucceſſive variation and degeneration of the primary ſpecies: and if it be once admitted, that there are families among plants and animals,

mals, that the aſs belongs to the family of the horſe, and differs from him only by degeneration; with equal propriety may it be concluded, that the monkey belongs to the family of man; that the monkey is a man degenerated; that man and the monkey have ſprung from a common ſtock, like the horſe and aſs; that each family, either among animals or vegetables, has been derived from the ſame origin; and even that all animated beings have proceeded from a ſingle ſpecies, which, in the courſe of ages, has produced, by improving and degenerating, all the different races that now exiſt.

Thoſe naturaliſts who, on ſuch ſlight foundations, have eſtabliſhed families among animals and vegetables, ſeem not to have conſidered, that, if their doctrine were true, it would reduce the product of the creation to any aſſignable number of individuals, however ſmall: For, if it were proved, that animals and vegetables were really diſtributed into families, or even that a ſingle ſpecies was ever produced by the degeneration of another, that the aſs, for inſtance, was only a degenerated horſe, no bounds could be fixed to the powers of Nature: She might, with equal reaſon, be ſuppoſed to have been able, in the courſe of time, to produce, from a ſingle individual, all the organized bodies in the univerſe.

But this is by no means a proper repreſentation of Nature. We are aſſured by the autho-

 rity

rity of revelation, that all animals have participated equally of the favours of creation; that the two firſt of each ſpecies were formed by the hands of the Almighty; and we ought to believe that they were then nearly what their deſcendants are at preſent. Beſides, ſince Nature was obſerved with attention, ſince the days of Ariſtotle to thoſe of our own, no new ſpecies have appeared, notwithſtanding the rapid movements which break down and diſſipate the parts of matter, notwithſtanding the infinite variety of combinations which muſt have taken place during theſe twenty centuries, notwithſtanding thoſe fortuitous or forced commixtures between animals of different ſpecies, from which nothing is produced but barren and vitiated individuals, totally incapable of tranſmitting their monſtrous kinds to poſterity. Were the external or internal reſemblances of particular animals, therefore, ſtill greater than they are between the horſe and aſs, they ſhould not lead us to confound theſe animals, or to aſſign them a common origin. For, if they actually proceeded from the ſame ſtock, we ſhould be enabled to bring them back to their primitive ſtate, and thus, with time, deſtroy the ſuppoſed operations of time.

It ſhould likewiſe be conſidered, that, though Nature proceeds with gradual, and often imperceptible ſteps, yet the intervals or marks of diſtinction are not always equal. The more dig-

nified

nified the ſpecies, they are always the leſs numerous, and ſeparated by more conſpicuous ſhades. The diminutive ſpecies, on the contrary, are very numerous, and make nearer approaches towards each other. For this reaſon, we are often tempted to erect them into families. But it ſhould never be forgotten, that theſe families are of our own creation; that we have contrived them to eaſe our memories, and to aid our imagination; that, if we cannot comprehend the real relations of all beings, it is our own fault, not that of Nature, who knows none of thoſe ſpurious families, and contains, in fact, nothing but individuals.

An individual is a ſolitary, a detached being, and has nothing in common with other beings, except that it reſembles, or rather differs from them. All the ſimilar individuals which exiſt on the ſurface of the earth, are regarded as compoſing the ſpecies of theſe individuals. It is neither, however, the number nor the collection of ſimilar individuals, but the conſtant ſucceſſion and renovation of theſe individuals, which conſtitute the ſpecies. A being, whoſe duration was perpetual, would not make a ſpecies. Species, then, is an abſtract and general term, the meaning of which can only be apprehended by conſidering Nature in the ſucceſſion of time, and in the conſtant deſtruction and renovation of beings. It is by comparing preſent individuals with thoſe which are paſt, that we

acquire a clear idea of ſpecies; for a compariſon of the number or ſimilarity of individuals is an acceſſory idea only, and often independent of the firſt: The aſs reſembles the horſe more than the ſpaniel does the greyhound; and yet the latter are of the ſame ſpecies, becauſe they produce fertile individuals; but, as the horſe and aſs produce only unfertile and vitiated individuals, they are evidently of different ſpecies.

It is in the characteriſtic diverſities of ſpecies, therefore, that the intervals in the ſhades of Nature are moſt conſpicuouſly marked. We may even affirm, that theſe intervals between different ſpecies are the moſt equal and conſtant, ſince we can draw a line of ſeparation between two ſpecies, that is, between two ſucceſſions of individuals who reproduce, but cannot mix; and ſince we cannot alſo unite into one ſpecies two ſucceſſions of individuals who reproduce by mixing. This is the moſt fixed and determined point in the hiſtory of Nature. All other ſimilarities and differences which can be found in the compariſon of beings, are neither ſo real nor ſo conſtant. Theſe intervals are the only lines of ſeparation which ſhall be followed in this work. We ſhall introduce no artificial or arbitrary diviſions. Every ſpecies, every ſucceſſion of individuals, who reproduce and cannot mix, ſhall be conſidered and treated ſeparately; and we ſhall employ no other families, genera, orders, and claſſes, than what are exhibited by Nature herſelf.

Species

Species being thus limited to a conſtant ſucceſſion of individuals endowed with the power of reproduction, it is obvious that this term ought never to be extended beyond animals and vegetables, and that thoſe nomenclators who have employed it to diſtinguiſh the different kinds of minerals, have abuſed terms and confounded ideas. We ſhould not, therefore, conſider iron as one ſpecies, and lead as another ſpecies: They ought only to be regarded as two different metals, and ſhould be diſtinguiſhed by lines of ſeparation very different from thoſe employed in the diſtinctions of animals or vegetables.

But to return to the degeneration of beings, and particularly to that of animals. Let us examine more cloſely the proceedings of Nature in the varieties ſhe offers to our conſideration: And, as we are beſt acquainted with the human ſpecies, let us obſerve how far the varieties of it extend. Among men, all the gradations of colour, from black to white, are exhibited: They likewiſe differ, by one half, in height of ſtature, thickneſs, ſtrength, ſwiftneſs, &c. But their mind is always the ſame. This latter quality, however, belongs not to matter, and ought not to be treated of in this place. The others are the common variations of Nature effected by the influence of climate and of food. But theſe differences in colour and dimenſions prevent not the Negro and White, the Laplander and Patagonian, the giant and dwarf, from mixing toge-

ther and producing fertile individuals; and, consequently, these men, so different in appearance, are all of one species, because this uniform reproduction is the very circumstance which constitutes distinct species. Beside these general varieties, there are others of a more particular nature, and yet fail not to be perpetuated; as the enormous legs of *the race of St. Thomas* in the island of Ceylon *; the red eyes and white hair of the Dariens and Chacrelas; the six fingers and toes peculiar to certain families †, &c. These singular varieties are accidental redundancies or defects, which, originating from some individuals, are propagated from generation to generation, like hereditary diseases. But they ought not to be regarded as constituting particular species; since these uncommon races of men with gross limbs, or with six fingers, are capable of mixing and of producing fertile individuals: The same remark is applicable to all other deformities which are communicated from parents to children.

Thus far only the errors of Nature and the varieties among men extend. If there are individuals who degenerate still farther, they produce nothing, and change not the constancy and unity of the species. Hence man constitutes but one and the same species; and, though this species be, perhaps, the most numerous, capri-

* See vol. ii. under the article, *Varieties of the Human Species.*

† See this and other curious subjects relative to generation, &c. in les Lettres de M. de Maupertuis.

cious,

cious, and irregular in its actions; yet all the diverſities in movement, food, climate, and other combinations which may be conceived, have not produced beings ſo different from each other as to conſtitute new ſpecies, and, at the ſame time, ſo ſimilar to ourſelves as to be conſidered as belonging to us.

If the Negro and the White could not propagate, or if their productions remained barren, they would form two diſtinct ſpecies; the Negro would be to man what the aſs is to the horſe; or, rather, if the White were man, the Negro would be a ſeparate animal, like the monkey; and we would be entitled to pronounce that the White and the Negro had not a common origin. But this ſuppoſition is contradicted by experience; for, as all the varieties of men are capable of mixing together, and of tranſmitting the kind, they muſt neceſſarily have ſprung from the ſame ſtock or family.

A ſlight diſparity of temperament, or ſome accidental defect in the organs of generation, will render two individuals of the ſame ſpecies barren. A certain degree of conformity in the ſtructure of the body, and in the organs of generation, will enable two animals, of different ſpecies, to produce individuals, ſimilar to none of the parents, reſembling nothing fixed or permanent; and, therefore, incapable of producing. But, what an amazing number of combinations are included in the ſuppoſition, that two animals,

mals, a male and a female, of a particular ſpecies, ſhould degenerate ſo much as to form a new ſpecies, and to loſe the faculty of producing with any other of the kind but themſelves? It is ſtill more incredible that the offspring of ſuch degenerated creatures ſhould follow exactly the ſame laws which are obſerved in the procreation of perfect animals: For a degenerated animal is a vitiated production; and how ſhould an origin that is vitiated, depraved, and defective, conſtitute a new ſtock, and not only give riſe to a ſucceſſion of permanent and diſtinct beings, but even to produce them in the ſame manner, and according to the ſame laws which regulate the propagation of animals whoſe race is pure and uncorrupted?

Though, therefore, we cannot demonſtrate, that the formation of a new ſpecies, by means of degeneration, exceeds the powers of Nature; yet the number of improbabilities attending ſuch a ſuppoſition, renders it totally incredible: For, if one ſpecies could be produced by the degeneration of another, if the aſs actually originated from the horſe, this metamorphoſis could only have been effected by a long ſucceſſion of almoſt imperceptible degrees. Between the horſe and aſs, there muſt have been many intermediate animals, the firſt of which would gradually recede from the nature and qualities of the horſe, and the laſt would make equal advances to thoſe of the aſs. What is become of theſe intermediate beings?

ings? Why are their repre[illegible]atives [illegible]d defcendants now extinguifhed? Why fh[illegible]d the two extremes alone exift?

We may, therefore, without hefitation, pronounce the afs to be an *Afs*, and not a degenerated horfe, a horfe with a naked tail. The afs is not a marvellous production. He is neither an intruder nor a baftard. Like all other animals, his family, his fpecies, and his rank, are afcertained and peculiar to himfelf. His blood is pure and untainted: And, though his race be lefs noble and illuftrious, it is equally unalloyed, and as ancient as that of the horfe. Why, then, fhould an animal fo good, fo patient, fo temperate, and fo ufeful, be treated with the moft fovereign contempt? Do men defpife, even in the brute-creation, thofe who ferve them beft, and at the leaft expence? The horfe we educate with great care; we drefs, attend, inftruct, and exercife him: While the poor afs, abandoned to the brutality of the meaneft fervants, or to the malicious abufe of children, inftead of acquiring, is rendered more ftupid and indocile, by the education he receives. If he had not a great ftock of good qualities, they would neceffarily be obliterated by the manner in which he is treated. He is the fport and paftime of ruftics, who conduct him with a rod, who beat, overload, and abufe him, without precaution or management. We confider not, that, if the horfe had no exiftence, the afs, both in himfelf and with regard to us, would be the firft, handfomeft,

handſomeſt, moſt beautiful, and moſt diſtinguiſhed animal in the creation. He holds, however, only the ſecond, inſtead of the firſt rank; and, for that reaſon, he is neglected and deſpiſed. It is compariſon alone that degrades him. We view and judge of him, not as he is, but in compariſon with the horſe. We forget that he is an aſs, that he has all the qualities and endowments peculiar to his ſpecies; and we contemplate the figure and qualities of the horſe, which the aſs neither has, nor ought to poſſeſs.

In his diſpoſition, the aſs is equally humble, patient, and tranquil, as the horſe is proud, ardent, and impetuous. Chaſtiſement and blows he endures with conſtancy, and perhaps with courage. He is temperate both as to the quantity and quality of his food. He eats contentedly the hardeſt and moſt diſagreeable herbage, which the horſe and other animals paſs by and diſdain. With regard to water, he is extremely nice. He drinks only from the cleareſt brooks he can find. In drinking, he is equally moderate as in eating. He never ſinks his noſe in the water, being afraid, as has been alledged, of the ſhadow of his ears*. As no body takes the trouble of combing him, he often rolls on the graſs, among thiſtles or ferns. Without paying any regard to the load he carries, he lies down and rolls as often as he can, ſeemingly with a view to reproach the neglect of his maſter; for he

* Cardan de Subtilitate, lib. x.

never

never wallows, like the horſe in the mire or in water. He is even afraid of wetting his feet, and turns off the road to avoid a puddle. His legs are alſo drier and cleaner than thoſe of the horſe. He is ſo ſuſceptible of education, as to be ſometimes exhibited in public ſhews *.

The aſs, when young, is gay, handſome, nimble, and even graceful. But, whether from age or maletreatment, he ſoon loſes theſe qualities, and becomes ſluggiſh, untractable, and ſtubborn. He diſcovers no ardour but in love. When under the influence of this paſſion, he is ſo furious that nothing can reſtrain him; and, by exceſſive indulgence, he ſometimes dies ſoon after gratification. As his love riſes to a degree of madneſs, his attachment to his progeny is likewiſe exceſſive. We are told by Pliny, that, when the young is ſeparated from the mother, ſhe will paſs through flames to rejoin it. Though commonly abuſed, the aſs has a great affection for his maſter, whom he ſcents at a diſtance, and diſtinguiſhes him from every other perſon. He knows likewiſe the places where his maſter puts up, and the roads which he frequents. His eyes are exceedingly good; his ſenſe of ſmelling is admirable, eſpecially when in queſt of a female. His ear is excellent, which has contributed to make him be ranked among the timid animals, who are all ſaid to have long ears and acute hearing. When oppreſſed with too great a load,

* *Aldrovand. de Quadruped. Solidiped. lib. i. p. 308.*

he

he difcovers his uneafinefs by inclining his head and lowering his ears. When tormented by abufe, he opens his mouth and draws back his lips in a moft difagreeable manner, which gives him an air of fcorn and derifion. If his eyes be covered, he ftands immoveably ftill; and, when lying on his fide, if the one eye refts on the ground, and the other be covered with a ftone or any other opaque body, he will continue in that fituation, without making the fmalleft effort to rife. He walks, trots, and gallops like the horfe: But all his movements are flower and more circumfcribed. Though he can run when he firft fets out, with confiderable fwiftnefs, he continues his career only for a fhort time; and, whatever pace he affumes, if pufhed hard, he is foon fatigued.

The horfe neighs; but the afs brays: The laft is performed by a very loud, long, difagreeable, difcordant cry, confifting of difcords alternately fharp and flat. He feldom brays but when preffed with hunger or love. The voice of the female is more clear and piercing than that of the male. When gelded, the afs brays with a low voice; and, though he makes the fame efforts and the fame motions of the throat, yet the found reaches to no great diftance.

Of all quadrupeds, the afs is leaft infefted with lice or other vermin, which feems to be owing to the fuperior hardnefs and drinefs of his fkin. For

For the ſame reaſon, he is leſs ſenſible to the whip, or the ſtinging of flies, than the horſe.

At the age of two years and a half, the firſt middle cutting teeth fall out, and the others on each ſide ſoon follow. They are replaced in the ſame time and in the ſame order as thoſe of the horſe. The age of the aſs is alſo diſtinguiſhable as in the horſe, by the ſame marks in the teeth.

The aſs, when two years and a half old, is capable of procreating. The female is ſtill more early, and equally laſcivious, which laſt is aſſigned as the reaſon for her want of fecundity. She rejects the cauſe of conception, unleſs the ardour of her deſire be repreſſed by blows. Without this precaution, ſhe is ſeldom impregnated. The ordinary ſeaſon of love is the months of May and June. When pregnant, ſhe ſoon becomes cool; and, in the eighth month, the milk appears in her paps. In the twelfth month ſhe brings forth; and ſolid maſſes are often found in the liquor of the amnios, ſimilar to the hippomanes of the foal. Seven days after delivery, her ardour returns, and ſhe is in a condition to receive the male. Thus the female aſs may be ſaid to be capable of perpetually nouriſhing and engendering. She produces but one colt; and there are very few examples of her bringing forth two at a time. At the end of five or ſix months, the colt may be weaned, eſpecially if the mother be pregnant, to enable her to afford proper nouriſhment to the fœtus. The

jack-

jack-ass should be chosen from the largest and strongest of his species. He should be at least three years of age, and should never exceed ten. He should have long limbs, a strong body, an elevated and small head, vivacious eyes, large nostrils and chest, fleshy loins, broad ribs, flat buttocks, a short tail, and shining soft hair of a deep gray colour.

The ass, like the horse, takes three or four years before he arrives at full maturity; and, of course, he lives to the age of 25 or 30 years. The females are said to live longer than the males. But this circumstance is probably owing to the females being often pregnant, and more humanely treated; while the males are perpetually persecuted with blows and excessive labour. They sleep less than the horse, and never lie down to sleep but after vast fatigue. The jack-ass lives longer than the stallion. The ardour of the former increases with his years; and, in general, the health of this animal is more permanent and established than that of the horse. The ass is less delicate, and subject to much fewer distempers. The ancients mention no other disease of the ass but the glanders, to which, as formerly remarked, he is still less liable than the horse.

Of asses there are different races, as well as of horses: But they are not equally known; because they have neither been taken care of, nor traced with the same attention. It cannot, however,

ever, admit of a doubt, that they all originated from warm climates. Ariſtotle aſſures us*, that, in his time, there were no aſſes in Scythia, or other northern nations, nor even in France, the climate of which, he remarks, was too cold: He adds, that cold climates either render them barren, or make them degenerate, which is the reaſon why they are ſmall and feeble in Illyrica, Thracia, and Epirus. They are ſtill ſo in France, though they have been long naturalized, and though, within theſe two thouſand years, the cold of the climate has been greatly diminiſhed by the cutting down of vaſt foreſts, and the draining of marſhes. But it is more certain, that they have not long reſided in Sweden and other northern countries †. They appear to have come originally from Arabia, and to have paſſed from Arabia to Egypt, from Egypt to Greece, from Greece to Italy, from Italy to France, and from thence to Germany, Britain, Sweden, &c.; for it is a known fact, that they are weak and ſmall in proportion to the coldneſs of the climate.

This migration appears to be well ſupported by the relations of travellers. Chardin remarks, 'That there are two kinds of aſſes in Perſia, 'one of which is ſlow and heavy, and uſed only 'for carrying burdens; the other race come 'from Arabia, and are the handſomeſt and fineſt

* De Generat. Animal. lib. xi.

† Linnæi Faun. Suec.

 'aſſes

'asses in the world. They have a glossy skin, 'a high head, and nimble limbs: They move 'well, and are employed for riding only. 'The saddles which are put upon them resemble 'round pannels, flattened above. They are 'made of woollen cloth, or of tapestry, with 'trappings and stirrups. The rider sits nearer 'the crupper than the neck. Some of these 'asses cost 400 livres, and they cannot be had 'for less than 25 pistoles. They are dressed 'like horses, and are never taught any motion 'but that of pacing. The art of training them 'consists of tying each fore-foot to the hind-'foot of the same side with two cords, which 'are made of the length that the ass is to pace, 'and are suspended by another cord passed un-'der the girth to the stirrup-leather. They 'are trained by grooms, every morning and 'evening, to this kind of motion. Their noses 'are slit, to make them breathe more freely; 'and they go so quick, that a horse must gal-'lop in order to keep up with them.'

It were to be wished that the Arabians, who preserve with so much care, and for so long a time, the races of their horses, would pay equal attention to their asses: From the above passage, and other sources of information, however, it appears, that Arabia is the original and best climate for both animals. From Arabia the asses passed into Barbary * and Egypt, where they

* See Shaw's Travels.

are

are large and handſome. In India and Guiney *, they are larger, ſtronger, and more uſeful than the horſes of theſe countries. They are in high eſtimation at Madura †, where one of the moſt conſiderable tribes of Indians revere them in a peculiar manner, becauſe they believe that the ſouls of all the nobility paſs into the bodies of aſſes. Laſtly, the number of aſſes exceeds that of horſes in all the ſouthern regions from Senegal to China. Wild aſſes are likewiſe more common than wild horſes. The Latins, copying the Greeks, called the wild aſs *onager*, which ſhould not be confounded, as moſt naturaliſts and travellers have done, with the zebra, becauſe the zebra is an animal of a different ſpecies from that of the aſs. The onager, or wild aſs, is not ſtriped like the zebra, and is not nearly of ſo elegant a figure. Wild aſſes are found in ſome of the iſlands of the Archipelago, and particularly in that of Cerigo ‡. There are many of them in the deſerts of Lybia and Numidia §. They are gray, and run ſo fleet, that they can only be overtaken in the chaſe by the beſt Barbary horſes. When they ſee a man, they give a loud cry, fling up their heels, ſtop, and fly not till he makes a near approach. They are caught in ſnares and gins made of ropes. They paſture

* Le Voyage de Guiné de Boſman, p. 239.

† Lettres Edifiantes, douzieme recueil, p. 96.

‡ Dapper's Collection, p. 185.

§ Leonis Afric. de Afric. Deſcript. tom. ii. p. 52. et l'Afrique de Marmol, tom. i. p. 53.

in troops; and their flesh is eaten by the natives. In the days of Marmol, there were wild asses in Sardinia; but they were smaller than those of Africa; and Pietro della Valle says, that he saw a wild ass in Bassora *. He differed not in figure from the domestic ass, only his colour was clearer, and he had, from the head to the tail, a line of white hair. He was also more vivacious and swifter than common asses. Olearius relates †, that one day the King of Persia invited him to the top of a small building, in the form of a theatre, to partake of a collation of fruits and sweet-meats; that, after the repast, thirty-two wild asses were introduced; that the King amused himself by shooting a few bullets and arrows at them; that he then allowed the same privilege to some of the nobility and ambassadors; that it was no small entertainment to see these asses running about, biting, and kicking each other, with several arrows sticking in their bodies; and that, when the whole were killed in presence of the King, they were sent to Ispahan for the royal family, the Persians being extremely fond of ass's flesh, &c. It does not appear, however, that all these 32 wild asses were taken in the forests: It is more probable that they were brought up in large parks for the pleasure of chasing and eating them.

Neither asses nor horses were found in America, though the climate of South America is

* Voyages de Pietre della Valle, tom. viii. p. 49.

† Voyage d'Adam Olearius, tom. i. p. 511.

very agreeable to their nature. Thofe tranfported thither by the Spaniards, and left in large iflands, or in the Continent, have multiplied exceedingly. They pafture in troops, and are taken by fnares, like the wild horfes.

The jack-afs and mare produce the large mules; and the horfe and fhe-afs produce the fmaller mules, which differ, in feveral refpects, from the former. But, as we mean to treat of the generation of mules, jumars, &c. in a feparate differtation, we fhall finifh the hiftory of the afs with the ufes men derive from this animal.

Wild affes being unknown in our climates, we cannot determine whether their flefh makes a wholefome or favory difh. But this we know, that the flefh of the domeftic afs is worfe, harder, and more difagreeably infipid than that of the horfe. Galen fays, that it is a pernicious aliment, and produces difeafes. The milk of the afs, on the contrary, is an approved remedy againft certain diftempers. The ufe of this remedy has been tranfmitted to us by the Greeks. To have good milk, the fhe-afs fhould be young, healthy, plump, and uncovered; the colt fhould be taken from her; fhe ought to be kept by herfelf, and fed with hay, oats, barley, and fuch falutary herbs as may have an influence on the malady. The milk fhould never be allowed to cool, nor even be expofed to the air, which injures it in a very fhort time.

 As

As the ſkin of the aſs is very hard and elaſtic, it is applied to many different uſes. It is employed for making ſieves, drums, ſhoes, and pocket-book parchment, which is laid over with a ſlight coat of plaſter. The aſs ſkin is likewiſe uſed by the eaſtern nations for making their ſagri or chagrin*. It is alſo probable, that the bones of the aſs are harder than thoſe of other animals, ſince the ancients preferred it for making their beſt ſounding flutes.

In proportion to his ſize, the aſs can carry more weight than any other animal. As he is fed at very little expence, and requires hardly any care, he is of great uſe for different kinds of country-buſineſs. He may likewiſe be uſed for riding: All his motions are ſoft, and he is not ſo apt to ſtumble as the horſe. In countries where the land is light, he is often yoked in the plough; and his dung, in ſtrong moiſt land, is an excellent manure.

* Voyage de Thevenot, tom. ii. p. 64.

Plate XII.

A. Bell Sculp.t

Ass.

THE OX*.

THE surface of the earth, adorned with its verdure, is the common and inexhaustible source, from which man and other animals derive their subsistence. Every animated being in nature is nourished by vegetables; and these, in their turn, are supported by the spoils of all that has lived or vegetated. Destruction is necessary to life: It is only by the destruction of beings, that animals can live and multiply. God, when

* The generic characters are: The horns bend out laterally; there are eight cutting teeth in the lower jaw, and none in the upper; the skin along the lower side of the neck is pendulous. The specific marks of the common bull and cow are, rounded horns, with a large space between their basis; *Pennant's Synops.* p. 4.

Bos, Gesner. quad. 25. Raii Syn. quad. p. 70.

Ocks, Klein. quad. 9.

Bos cornibus levibus, teretibus, sursum reflexis; *Brisson*, *quad.* 52.

Bos taurus, cornibus teretibus extrorsum curvatis, palearibus laxis; *Linn. Syst.* 98.

N. B. The word *Ox*, in its common acceptation, denotes black cattle in general, without regard to sex. In a more restricted sense, it signifies a castrated *bull*. To prevent confusion, when *ox* is used in the last sense, it is printed in Italic characters.

 be

he created the firſt individuals of each ſpecies of animal and vegetable, not only beſtowed form on the duſt of the earth, but gave it animation, by infuſing into theſe individuals a greater or ſmaller quantity of active principles, of living organic particles, which are indeſtructible *, and common to every organized being. Theſe particles paſs from body to body, and are equally the cauſes of life, of the continuation of the ſpecies, of growth, and of nutrition. After the diſſolution of the body, after it is reduced to aſhes, theſe organic particles, upon which death has no influence, ſurvive, circulate through the univerſe, paſs into other beings, and produce life and nouriſhment. Hence, every production, every renovation or increaſe by means of generation, of nutrition, or of growth, implies a preceding deſtruction, a converſion of ſubſtance, a tranſlation of organic particles, which never multiply, but, uniformly ſubſiſting in equal numbers, render Nature always equally animated, the earth equally peopled, and equally reſplendent with the original glory of that Being by whom it was created.

Taking beings in general, therefore, the total quantity of life remains always the ſame; and death, which ſeems to be an univerſal deſtroyer, annihilates no part of that primitive life which is common to all organized bodies. Like all

* See Chap. VI. &c. of the ſecond volume of this work.

ſubordinate

ſubordinate powers, Death attacks individuals only. His blows are confined to the ſurface: He deſtroys the form, but has no influence on the matter. He is unable to injure Nature; his ſtrokes, on the contrary, make her ſhine with additional luſtre. She permits him not to annihilate the ſpecies, but allows him, ſucceſſively, to mow down individuals, with a view to demonſtrate her independence both of Death and of Time, to give her an opportunity of exerting, at every inſtant, her power, which is always active, and of manifeſting the extent of her reſources by her fertility, and, by a perpetual renovation of beings, to make the univerſe a theatre always filled with objects which attract our attention by their grandeur and novelty.

It is apparent, therefore, that a ſucceſſion of beings cannot otherwiſe be effected than by mutual deſtruction. For the nouriſhment and ſubſiſtence of animals, vegetables or other animals muſt be ſacrificed: And as, both before and after this deſtruction, the quantity of life remains always the ſame, Nature ſeems to be indifferent whether particular ſpecies be more or leſs conſumed. Like an œconomical parent, however, in the midſt of fulneſs and affluence, ſhe fixes limits to her expence, and prevents any unneceſſary waſte, by beſtowing on few animals the inſtinct of feeding on fleſh, while ſhe has multiplied, profuſely, both the ſpecies and the indi-

viduals

viduals of those which live upon plants. In the vegetable kingdom, she seems even to be prodigal of species, which are every where diffused, and endowed with an astonishing fecundity. Man, it is probable, has contributed not a little to promote the intentions of Nature, by maintaining, and even establishing, this order upon the earth; for, in the ocean, we actually perceive that indifference which we have supposed. Fishes of every kind are almost equally voracious. They live upon their own or different species, and perpetually devour each other, without annihilating any particular kind; because their fecundity is proportioned to the depredations they commit, and the whole consumption reverts to the advantage of reproduction.

Man knows how to exercise his power over animals. He selects those whose flesh is most agreeable to his palate, makes them his domestic slaves, and multiplies them far beyond what Nature would have done. By his industry in promoting their increase, he seems to have acquired a right to sacrifice them. But he extends this right farther than his necessities demand. He makes war against savage animals, birds, and fishes. He does not even limit himself to those of the climate he inhabits, but goes to foreign nations, and to the midst of the ocean, in quest of new luxuries. All Nature seems to be insufficient to satisfy the intemperance and caprice of his appetite. Man alone consumes more flesh than

than all the other carnivorous animals in the world. He is unquestionably the greatest destroyer; and he is so, more from abuse than necessity. Instead of enjoying, with moderation, the benefits presented to him, instead of dispensing them with equity, or making reparation in proportion to his waste, by renewing what he annihilates, the rich man places his chief glory in consuming at table more in one day than would be sufficient to feed many families. His abuse is not confined to the animals, but extends to his fellow-men, many of whom languish with famine and misery, and labour only to satiate the vanity and luxurious appetite of the opulent, who kill the poor by famine, and put an end to their own existence by excess.

Man, notwithstanding, like some other animals, might live upon vegetables. Flesh, which appears so analogous to flesh, affords not better nourishment than grain or bread. That nutriment which contributes to the expansion, growth, and support of the body, consists not of the inert and visible matter of which the texture of flesh and of herbs is composed, but of the organic particles contained in both these substances; for the ox, in browsing the herbage, acquires as much flesh as man and other animals who live entirely on carnage and blood. There is but one difference between these two kinds of aliment: When the quantities are equal, flesh, grain, and seeds, contain a greater number of organic

organic particles than herbage, or the leaves, roots, and other parts of plants. Of this fact we are ascertained by examining infusions of these substances. So that man, and the other carnivorous animals, whose stomachs and intestines are not so capacious as to admit a great deal of aliment at a time, are unable to devour herbage in quantities sufficient to afford the number of organic particles necessary for nourishing them. It is for this reason, that man, and the other animals who have but one stomach, can subsist only upon flesh and seeds, which contain, in a small volume, a great number of these organic nutritive particles: While the ox, and other ruminant animals, who have several stomachs, one of which is remarkably capacious, and, consequently, can admit a large quantity of herbage, are enabled to extract from this mass a number of organic particles sufficient for their nourishment, growth, and multiplication. Here the quantity compensates the quality of the nutriment. But the stock is the same. It is the same matter, the same organic particles, which nourish man, the ox, and all other animals.

It will be objected, that the horse has but one stomach, and a very small one; that the ass, the hare, and other animals which live upon herbs, have likewise but one stomach; and, consequently, that this theory, however probable, is not well founded. These apparent exceptions, however, so far from weakening, seem to confirm

ſirm the truth of it: For, though the horſe and the aſs have but one ſtomach, they have ſacs or pouches in their inteſtines, ſo large, that they may be compared to the paunch of ruminating animals; and hares have a blind gut ſo long and wide, that it is equivalent, at leaſt, to a ſecond ſtomach. Thus, it is by no means ſurpriſing that theſe animals are properly nouriſhed by herbage alone: And, in general, it will always hold, that the different modes of feeding among animals depend on the total capacity of their ſtomach and inteſtines: For ruminating animals, as the ox, the ſheep, the camel, &c. have four ſtomachs, and inteſtines of a prodigious length; and herbage alone is ſufficient to nouriſh them. Horſes, aſſes, hares, rabbits, Guiney-pigs, &c. have one ſtomach only, but they have a blind gut equivalent to a ſecond ſtomach; and they feed upon herbage and grain. The wild boar, the hedge-hog, the ſquirrel, &c. whoſe ſtomachs and inteſtines are of a mean capacity, eat little herbage, but live principally upon ſeeds, fruits, and roots: And thoſe animals which, in proportion to the ſize of their bodies, have ſmall ſtomachs and inteſtines, as the wolf, the fox, the tiger, &c. are obliged to chooſe food of the moſt ſucculent kind, and which contains the greateſt number of organic particles, and, of courſe, to live upon fleſh, blood, ſeeds, and fruits.

It is obvious, therefore, that the diverſity of taſtes perceived in the appetites of different animals, ariſes not from the ſuperior agreeableneſs of particular kinds of food to their palates, but from a phyſical cauſe neceſſarily depending on the ſtructure of their bodies: For, if they were not oftener determined by neceſſity than by taſte, how could they devour corrupted carrion with equal avidity as freſh and ſucculent fleſh? Why ſhould they eat, without diſtinction, every ſpecies of fleſh? We ſee, that domeſtic dogs, who have the liberty of making a choice, conſtantly refuſe certain meats, as pork, woodcocks, thruſhes, &c. But wild dogs, wolves, foxes, &c. eat, indiſcriminately, the fleſh of ſwine, woodcocks, birds of every kind, and even frogs; for I once found two frogs in the ſtomach of a wolf. When they can procure neither fleſh nor fiſh, they eat fruits, ſeeds, grapes, &c. But they uniformly prefer thoſe kinds of food which, in a ſmall volume, contain a great quantity of nutriment, or rather of organic particles, proper for nouriſhing and ſupporting their bodies.

If theſe proofs ſhould not appear to be ſufficiently ſtrong, let us attend to the manner of feeding cattle, when the object is to fatten them. They are firſt caſtrated, which obſtructs the paſſage through which the greateſt quantity of organic particles eſcape. Then, inſtead of allowing them to feed, as uſual, on herbage alone, they are ſerved with bran, corn, turnips, and, in a word,

word, with food more substantial than grass *. The quantity of flesh, juices, and fat, soon augments; and, from a flesh naturally hard and dry, good and succulent meat is produced, which is used as the basis of our best dishes.

From what has been advanced, it is likewise a consequence, that man, whose stomach and intestines are proportionally of no great capacity, could not live upon herbage alone. It is an incontestible fact, however, that he can live pretty well upon bread, herbs, and the seeds of plants; for we know whole nations, and particular orders of men, who are prohibited by their religion from eating any animal substance. But these examples, though supported by the authority of Pythagoras, and recommended by some physicians, appear insufficient to convince us, that the health and multiplication of mankind would be improved by feeding solely upon potherbs and bread; especially when it is considered, that the country-people, whom the luxury and sumptuousness of the opulent reduce to this mode of living, languish and die much sooner than men of the middle rank of life, who are equally strangers to want and to excess.

Next to man, the carnivorous animals are the greatest destroyers. They are at once the ene-

* No food fattens cattle so successfully or so quickly as green herbage; but turnips, and the dry kinds of nourishment mentioned in the text, are used only in winter, when green vegetables cannot be procured in sufficient quantities.

mies

mies of Nature and the rivals of the human kind. A conſtant attention, joined to the moſt indefatigable induſtry, are neceſſary to protect our flocks, poultry, &c. from birds of prey, and from the rapacious jaws of the wolf, fox, weaſel, martin, &c. A perpetual war is requiſite to defend even our grain, fruits, and garments, againſt the voracious attacks of rats, caterpillars, beetles, mites, &c.; for inſects are to be ranked among thoſe animals which are more deſtructive than uſeful. But the ox, the ſheep, and other herbivorous animals, are not only the moſt precious and moſt uſeful to man, but they conſume leſs, and are maintained at the ſmalleſt expence. With regard to this article, the excellence of the ox is ſuperior to that of any other creature; for he reſtores to the earth as much as he takes from it: He even enriches and improves the ground on which he feeds. The horſe, on the contrary, and moſt other animals, impoveriſh, in a few years, the beſt paſture-lands *.

But theſe are not the only advantages which man derives from the ox. Without the aid of this uſeful animal, both the poor and the opulent would find great difficulty in procuring ſubſiſtence; the earth would remain uncultivated; our fields and gardens would become parched and barren. All the labour of the country de-

* It were to be wiſhed that the author had ſupported this aſſertion by facts; for what he here advances, is not only doubtful, but probably altogether without foundation.

pends

pends upon him. He is the most advantageous domestic of the farmer. He is the very source and support of agriculture. Formerly the ox constituted the whole riches of mankind; and he is still the basis of the riches of nations, which subsist and flourish in proportion to the cultivation of their lands and the number of their cattle: For in these all real wealth consists; every other kind, even gold and silver, being only fictitious representations, have no value, but what is conferred on them by the productions of the earth.

The form of the ox's back and loins show that he is not equally qualified for carrying burdens as the horse, the ass, or the camel. But the thickness of his neck, and broadness of his shoulders, point him out as destined for the yoke. Though his chief strength lies in his shoulders, yet, in many provinces of France, they oblige him to draw by the horns. In support of this practice, it is alleged, that, when yoked in this manner, he is more easily managed. His head, I allow, is so very strong, that he may draw tolerably well by the horns; but he would draw with still much more advantage, if yoked by the shoulders. Nature seems to have intended him for the plough. The largeness of his body, the slowness of his movements, the shortness of his legs, and even his tranquillity and patience under labour, concur in rendering him superior to every other animal for cultivating the ground, and

overcoming that conſtant reſiſtance which the earth oppoſes to his efforts. The horſe, though perhaps equal in ſtrength, is not ſo well fitted for this kind of labour. His limbs are too long, and his motions too ſudden and violent. Beſides, he is impatient, and eaſily diſheartened *. When employed in this heavy work, which requires more perſeverance than ardour, more force than quickneſs, and more weight than ſpring, we rob the horſe of all the nimbleneſs of his motions, and all the graces of his gait and attitudes.

Of thoſe animals which man forms into flocks, and whoſe multiplication is his principal object, the females are more uſeful than the males. The produce of the cow is almoſt perpetually renewed. The fleſh of the calf is equally wholeſome and delicate; the milk is an excellent food, eſpecially for children; butter is uſed in moſt of our diſhes; and cheeſe is the principal nouriſhment of our peaſants. How many poor families are reduced to the neceſſity of living entirely on their cow? Thoſe very men who toil from morning to night, who groan and are bowed down with the labour of ploughing the ground, obtain nothing from the earth but black bread,

* The horſe, when properly trained, is equally firm and ſteady at a conſtant draught as the ox, and much more capable of an extraordinary exertion, when that becomes neceſſary. This quality gives him an evident ſuperiority over the ox; becauſe it renders it unneceſſary for the farmer to keep ſupernumerary cattle for the ſole purpoſe of overcoming any violent reſiſtance that may occur.

and

and are obliged to yield to others the flour and the fubftantial part of the grain. They raife rich crops, but not for themfelves. Thofe men who breed and multiply our cattle, who fpend their whole lives in rearing and guarding them from injuries, are debarred from enjoying the fruits of their labour. They are denied the ufe of flefh, and obliged, by their condition, or rather by the cruelty of the opulent, to live, like horfes, upon barley, oats, coarfe pot-herbs, &c.

The cow may likewife be ufed in ploughing; and, though her ftrength is not equal to that of the *ox*, fhe frequently fupplies his place. But, when employed in this way, fhe fhould be matched, as nearly as poffible, with an *ox* of the fame ftature and ftrength, or with another cow, in order to maintain the equality of the draught, and to keep the plough in equilibrium between the two forces, which facilitates the labour, and makes the furrows more regular. From fix to eight oxen are often employed in ftiff land, and particularly in rough fallow-grounds, which rife in large maffes. But two cows are fufficient for light foils; and, in very light land, the length of the furrow drawn at once may be farther extended. The antients limited the length of the furrow, to be drawn without any interruption in the motion of the cattle, to 120 paces; after which they were allowed to ftop, for a few moments, to recover their breath, before going on with the fame furrow, or beginning a

 new

new one. But the ancients delighted in the ſtudy of agriculture, and gloried in ploughing themſelves, or at leaſt in encouraging their labourers, and rendering both them and the cattle as eaſy as poſſible. Among the moderns, however, thoſe who enjoy the moſt luxurious productions of the earth, are leaſt acquainted with the means of encouraging or ſupporting the arts of cultivation.

Propagation is the principal uſe of the bull. Though he may likewiſe be trained to labour; yet his obedience is uncertain, and it is always neceſſary to guard againſt the improper exertions of his ſtrength. Nature has endowed the bull with a bold and untractable diſpoſition. In the rutting ſeaſon, he becomes perfectly ungovernable, and often furious. But caſtration, while it deſtroys the ſource of theſe impetuous emotions, diminiſhes not his ſtrength. On the contrary, it makes him larger, heavier, and more fit for the labour to which he is deſtined. It alſo changes his diſpoſitions; for, after this operation, he becomes more tractable, more patient, and leſs troubleſome to his neighbours. A flock of bulls would exhibit a ſcene of the moſt frightful diſcord; they could neither be intimidated nor conducted by man.

The manner of performing caſtration is well known to the country-people. Different modes, however, are practiſed, and their effects are perhaps not properly attended to. In general, the

time

time moſt proper for caſtration, is that which immediately precedes puberty, which happens at the age of 18 months or two years. When performed more early, the animals ſeldom ſurvive *. However, when young calves are caſtrated ſoon after birth, and ſurvive an operation ſo dangerous at that period of life, they become larger and fatter *oxen*, than if it had been delayed till the ſecond, third, or fourth year. But, in the latter caſe, they preſerve more of their natural activity and courage: And, when delayed till the ſixth, ſeventh, or eighth year, the animals hardly loſe any of the qualities peculiar to the male ſex. They are more impetuous and untractable than other *oxen*; and, in the ſeaſon of love, they are apt to haraſs the females, from whom they ſhould be carefully ſeparated: For copulation, or even contact with *oxen*, produces warty tumors on the parts of the cow, which it is neceſſary to remove by the actual cautery. This diſeaſe † is ſuppoſed to proceed from a certain purulent and corroſive matter ejected from *oxen*, which have either been completely caſtrated, or have had their teſtes twiſted and compreſſed, with a view to deſtroy their power of generating.

* Here our author's uſual accuracy ſeems to have forſaken him. It is a certain and well known fact, that, when caſtration is performed at the age of eight or ten days, not one in twenty dies, in proportion to the number of thoſe which periſh, when the operation is delayed to the age of puberty.

† This diſeaſe was never heard of, as far as I can learn, in Britain.

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The females generally come in ſeaſon in the ſpring; and, in France, moſt of them receive the bull and are impregnated from the 15th of April to the 15th of July; but ſome are earlier and others later. Their time of geſtation is nine months; and they bring forth in the beginning of the tenth. Hence our calves are numerous from the 15th of January to the 15th of April. They are alſo plenty during the whole ſummer, and become more rare in autumn. The marks of ardour in the cow are not equivocal. She then lows more frequently and with more violence than at any other time. She mounts upon cows, *oxen*, and even upon the bull. The external parts ſwell, and become prominent. When her ardour is greateſt, ſhe ought to be gratified; for, if allowed to abate, ſhe is apt not to retain.

The bull, like the ſtallion, ſhould be choſen from the handſomeſt of his kind. He ſhould be large, well made, and in good condition with regard to fatneſs. His eyes ſhould be black, his aſpect bold, his front open, his head ſhort, his horns thick, ſhort, and black, his ears long and buſhy, his muzzle large, his noſe ſhort and ſtraight, his neck fleſhy and thick, his cheſt and ſhoulders large, his loins firm, his back ſtraight, his legs thick and fleſhy, his tail long and well covered with hair, his tread firm and ſure, and his hair of a reddiſh colour*. Cows often hold at the firſt, ſecond, or third time; and, as ſoon as they

* La Nouvelle Maiſon Ruſtique, tom. i. p. 298.

are impregnated, though the ſymptoms of ardour ſtill appear, the bull often refuſes to cover them: But, in general, their ardour ceaſes immediately after conception, and they ſpontaneouſly repel the approaches of the bull.

Cows with young, when improperly managed, or put to the plough, carriage, &c. are ſubject to abortion; they ſhould, therefore, be carefully watched and attended, to prevent them from leaping hedges or ditches. They ſhould alſo be fed on rich paſture, and in parks which are not too moiſt or marſhy. Six weeks or two months before bringing forth, their ordinary quantity of food ſhould be enlarged *, by putting graſs into their ſtalls in ſummer, and, in winter, by giving them bran, lucern, ſaintfoine, &c. From this period, no milk ſhould be drawn from them, the whole of it being neceſſary for nouriſhing the fœtus. In ſome cows, the milk dries up entirely a month or ſix weeks before they bring forth; but thoſe which have milk to the laſt, make the beſt mothers and the beſt nurſes. This late milk, however, is commonly bad, and in ſmall quantity. The delivery of the cow requires ſtill more attention than that of the mare; for the former is weaker and more exhauſted by the operation. She ought to be put into a ſtable,

* The practice in this countrry is directly the reverſe of that here recommended. When in good order, cows are more ſparingly fed ſome time before they bring forth; becauſe the oppoſite management is ſuppoſed to make the calf grow too large, and, of courſe, to endanger the life of the mother.

to have good litter, and to be fed, for ten or twelve days, with bean-flour, or oats, diluted in falted water, and plenty of lucern, faintfoine, or good grafs*. This time is generally fufficient for the recovery of her ftrength; after which fhe may gradually return to her ufual mode of living and pafturing. During the firft two months, her milk, which is then not good, fhould be folely appropriated to the nourifhment of the calf.

That the calf may be kept warm, and fuck as often as it choofes, it fhould be allowed to remain conftantly with the mother for the firft five or fix days. After this period, the calf, if always left with the mother, would exhauft her by fucking too much. It is fufficient to let calves fuck twice or thrice a-day; and, to improve their flefh and fatten them quickly, they fhould every day be fed with raw eggs, boiled milk, and bread. At the end of four or five weeks, calves managed in this manner are fit for the butcher. When defigned for the market, they may be allowed to fuck only 30 or 40 days †. But thofe which are intended to be brought up,

* For fome days after calving, our cows are generally prevented from eating green fucculent food. They are preferved from cold; and tepid water, mixed with oat-meal, or fome other palatable fubftance, is given them to drink.

† If this be the practice in France, the veal muft be bad. Calves deftined for the market fhould be fatted at leaft eight or ten weeks, otherwife the veal cannot acquire its full perfection. Neither is it ufual, in cultivated countries, to allow the calves to fuck; for the milk is given them by the hand.

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ſhould have ſuck two months at leaſt; for the longer they are allowed to ſuck, they become the larger and ſtronger cattle. Calves brought forth in the months of April, May, and June, are beſt for rearing; thoſe that come later into the world, being unable to reſiſt the rigour of winter, generally languiſh and die with cold. At the end of two, three, or four months, and before weaning them entirely, they ſhould be fed with good graſs or tender hay, to accuſtom them gradually to their future nouriſhment. They ſhould then be ſeparated from the mother, and never again be permitted to approach her either in the ſtable or the field. In ſummer, they ſhould be paſtured every day from morning to night. But, as ſoon as the cold commences in autumn, they ſhould be turned out to paſture late in the morning, and brought back to the ſtable early in the evening: And, during winter, as cold is extremely hurtful to them, they ſhould be kept warm in a cloſe well littered ſtable. Along with their uſual food, they ſhould have faintfoine, lucern, &c. and never be allowed to go out, except in ſoft weather *. During the firſt winter, which is the moſt dangerous period of their exiſtence, they require a great deal of attention. In the ſucceeding ſummer, they acquire ſtrength ſuffi-

* Young cattle ſhould be allowed to go abroad every day, unleſs the weather be extremely tempeſtuous. It preſerves them in the habit of uſing their limbs, makes their blood circulate with more freedom, and excites their appetite.

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cient to fortify them againſt the attacks of the ſecond winter.

The cow arrives at the age of puberty in eighteen months, and the bull in two years *. But, though they are then capable of generating, they ſhould not be admitted to each other till they be three years old. From three to nine years, theſe animals are in their greateſt vigour. After this period, both cows and bulls are only fit for being fattened and delivered to the butcher. As they acquire their full growth in two years, the duration of their life, like that of moſt other animals, is nearly ſeven times two, or fourteen years; few of them ever exceed this age.

In all quadrupeds, without exception, the voice of the male is ſtronger and deeper than that of the female. Though the ancients allege, that the cow, the *ox*, and even the calf, have deeper voices than the bull; yet the contrary is certain; for the voice of the bull reaches much farther. The bellowing of the bull not being a ſimple ſound, but compoſed of two or three octaves, the higheſt of which ſtrikes the ear moſt forcibly, may have given riſe to this deception: But, when we liſten attentively, we perceive, at the ſame time, a ſound much graver than is uttered by the cow, the *ox*, or the calf, whoſe lowings are alſo a great deal ſhorter. The bull never bellows, but when ſtimulated by love; the low-

* In this country, cows and bulls are capable of procreating at a much earlier period.

ings of the cow proceed oftener from terror or timidity, than from any other cause; and pain, hunger, or the absence of the mother, produce the complaints of the calf.

The heaviest and most sluggish animals are not those which sleep longest or most profoundly. The slumbers of the *ox* are slight and short. The smallest noise rouses him. He lies commonly on the left side; and the left kidney is always larger and fatter than the right.

The *ox*, like other domestic animals, varies in colour. The reddish colour, however, is most common, and in highest estimation. Some praise the black colour; and others maintain, that bay *oxen* live longest; that the brown soon decay and lose their spirit; and that the gray, the dappled, and the white, are of no value for the purposes of labour, and should only be fattened for slaughter. But, whatever be the colour of an *ox*, his coat ought to be smooth, shining, thick, and soft to the touch; for, when rough and unequal, it indicates bad health, or a weak constitution. A good *ox* for the plough should neither be too fat nor too lean; his head ought to be short, his ears large, and well covered with hair, his horns strong, shining, and middle-sized, his fore-head broad, his eyes large and black, his muzzle thick and flat, his nostrils wide, his teeth white and even, his lips black, his neck fleshy and strong, his shoulders thick and massy, his chest large, his dewlap long, and extending as far as

his knees, his loins very broad, his belly wide and prominent, his flanks large, his haunches long, his crupper thick, his legs and thighs large and nervous, his back ſtraight and plump, his tail as long as to reach the ground, and covered with fine buſhy hair, his feet firm, his ſkin thick and pliable *, his muſcles well raiſed, and his toes or hoofs broad and ſhort †. He ſhould likewiſe feel the goad with ſenſibility, obey the call of his driver, and be well trained. But it is only by degrees, and by beginning at an early period, that the *ox* can be taught patiently to bear the yoke, and to allow himſelf to be conducted with eaſe. At the age of two and a half, or three years at moſt, we ſhould begin to tame him, and to accuſtom him to the yoke. If longer delayed, he often becomes perfectly ungovernable. Patience, mildneſs, and even careſſes, are the only means which ſhould be employed. Force and harſh treatment ſerve no other purpoſe than to diſpirit and render him totally unmanageable. He ſhould be ſtroaked and careſſed; and he ſhould occaſionally be fed with boiled barley, bruiſed beans, and other aliments of the ſame kind, mixed with a little ſalt, of all which he is extremely fond. His horns, at the ſame time, ſhould be frequently tied. Some

* La Nouvelle Maiſon Ruſtique, tom. i. p. 279.

† Theſe marks are at preſent out of faſhion in Britain, and not to be depended on. Every nation, every province, has its own favourite marks; but moſt of them are temporary and fluctuating.

days

days afterwards, he may be yoked to the plough along with another *ox* of the ſame ſtature, which has been previouſly trained. They ſhould be tied up together at the manger, and led to the ſame paſture, in order to make them thoroughly acquainted, and acquire the habit of having always the ſame movements. At firſt the goad ſhould never be uſed; for it contributes to render them untractable. They ſhould be forced to work only a little at a time; for, when not thoroughly broke, they are ſoon fatigued. For the ſame reaſon, they ſhould be fed more plentifully than uſual.

The *ox* ought to labour only from three to ten years; for, when he works till he be farther advanced, the quality of the beef is injured. The age of this animal is known by his teeth and horns. The middlemoſt fore-teeth fall out when he is ten months old, and are replaced by others which are broader, but not ſo white. At the age of ſixteen months, thoſe next to the former ſhed, and are ſucceeded by others. At the age of four years, the whole cutting teeth are renewed; and they are then even, long, and pretty white. In proportion as the *ox* advances in years, theſe teeth wear and become black and unequal. The ſame thing happens to the bull and cow. Thus neither ſex nor caſtration have any influence on the growth or ſhedding of the teeth. Neither do theſe circumſtances produce

any

any alteration in the caſting of the horns; for, at the age of three years, the bull, cow, and *ox*, ſhed their horns *, which are replaced by others, and which, like the ſecond teeth, never fall off. The horns of the *ox* and cow are longer and thinner than thoſe of the bull. The growth of the ſecond horns is not uniform. The firſt year, which is the fourth of the animal's age, two neat pointed horns, terminated near the head by a kind of ring, ariſe. In the following year, this ring mounts farther from the head, being puſhed forward by a new horny cylinder, which is likewiſe terminated by another ring, and ſo on; for the horns continue to grow as long as the animal lives. Theſe rings are very apparent; and, by their number, the ox's age may be eaſily counted, by adding three years to the number of intervals between the rings.

The horſe eats ſlowly, but almoſt perpetually. The ox, on the contrary, eats faſt, and fills his ſtomach in a very ſhort time; after which, he lies down to ruminate. This difference in eating, proceeds from the different conformation of their ſtomachs. The ox, whoſe two firſt ſtomachs conſiſt of but one large bag, can, without

* Black cattle, it is well known, never do *ſhed their horns*. It is aſtoniſhing that our learned author ſhould have been betrayed into this blunder, and ſtill more aſtoniſhing that it ſhould be repeated in the laſt Paris edition, in 12mo. The rings he mentions do, indeed, begin to appear at this period, and continue to increaſe, with ſome regularity, as long as the animal lives.

incon-

inconveniency, quickly throw in a great quantity of herbage, which, by means of chewing the cud, he digests at leisure. But the stomach of the horse, which is single and small, can only receive a small quantity of food; and he, therefore, fills it gradually, in proportion as the herbage dissolves, and passes into the intestines, where the decomposition of the aliment is chiefly effected. Having examined, in the ox and horse, the successive product of digestion, particularly in the decomposition of hay, I remarked, in the ox, that, when the aliment was passing into that part of the paunch which forms the second stomach, it was reduced to a kind of green paste, resembling boiled spinage; that, under this form, it is retained in the folds of the third stomach; that the decomposition is completed in the fourth stomach; and that hardly any thing passes into the intestines, except fæces or dregs. But, in the horse, the hay is not decomposed, either in the stomach or first portions of the intestines, where it only becomes more soft and pliable, being macerated by the liquor with which it is surrounded. With very little alteration, it arrives at the cæcum and colon. It is chiefly in these two intestines, whose extraordinary capacity corresponds with that of the paunch of ruminating animals, that the food of horses is decomposed. But the decomposition is never so complete, as that which is effected in the fourth stomach of the ox.

For

For these reasons, and even from inspecting the part it is easy to conceive how rumination is performed, and why the horse neither ruminates nor vomits. Rumination is only a vomiting without much effort, occasioned by the reaction of the first stomach upon its contents. The ox completely fills his two first stomachs, or portions of the paunch. This membrane, when distended, re-acts with great force on the food it contains, which is very little cut by chewing, and whose volume is greatly augmented by fermentation. If the aliment were liquid, this contracting force would make it pass into the third stomach, which communicates with the other by a narrow canal, whose orifice is situated in the superior part of the first, and nearly as high as that of the gullet. Hence this canal can only admit the food, after it is reduced to a more fluid form. The drier parts must, therefore, rise into the gullet, the orifice of which exceeds that of the canal. When the food comes back into the mouth, the animal chews it again, and macerates it with a fresh quantity of saliva, which gradually liquifies it to such a degree, as enables it to pass through the canal into the third stomach, where it is still farther diluted before it enters the fourth. It is in this last stomach, that the hay, which is there reduced to a perfect mucilage, is completely decomposed. To confirm the truth of this explanation, it may be remarked, that, as long as these animals suck, or

are nouriſhed with milk, and other liquid aliments, they never ruminate; and that, in winter, when they are fed with dry aliment, they ruminate much oftener than during ſummer, when the graſs is tender and ſucculent. The ſtomach of the horſe, on the contrary, is ſmall; the orifice of the œſophagus is narrow, and that of the pylorus very large. Theſe circumſtances alone render rumination impracticable; for the food contained in this ſmall ſtomach, though perhaps it ſuffers a greater compreſſion than from the ſtomach of the ox, cannot mount upwards; becauſe it deſcends with greater eaſe through the pylorus, which is much wider than the gullet. To paſs through the pylorus, it is not even neceſſary that the hay be reduced to a ſoft maſh; for the contracting force of the ſtomach is capable of puſhing it through, when almoſt dry. This difference of ſtructure, therefore, enables the ox to ruminate, and prevents the horſe from performing that function. But there is another ſingularity in the horſe, which abſolutely prevents him from vomiting, and, conſequently, from chewing the cud. The alimentary canal, by coming in a very winding direction into the ſtomach, the coats of which are exceedingly thick, makes a gutter in piercing them, ſo oblique, that, inſtead of being opened by the convulſive motions of the ſtomach, they only ſerve to ſhut it the cloſer. Though this, as well as other differences of ſtructure obſervable in the bodies

bodies of these two animals, are derived from Nature, because they are invariably the same; yet, in the developement of the soft parts, particularly, there are differences apparently constant, which, nevertheless, may, and often are varied by particular circumstances. The great capacity of the ox's paunch, for example, is not solely a production of Nature. Its original conformation, on the contrary, is varied, and its capacity gradually enlarged, by the fermentation and great volume of the aliments it receives: For, in a calf that has never eat grass, though not very young, the paunch is proportionally much less than in the adult. Hence this uncommon capaciousness of the paunch proceeds from the extension occasioned by the great mass of aliment daily devoured. Of this I was convinced by an experiment, which appears to be decisive. I fed two lambs, of equal ages, and weaned, at the same time, the one with bread, and the other with grass. At the end of twelve months, when both were opened, I found that the paunch of the latter was much larger than that of the former.

It is alledged, that *oxen* which eat slowly, support labour longer than those that eat quickly; that the *oxen* of dry and elevated countries are more active, vigorous, and healthful, than those which are fed in low moist grounds; that they are stronger when fed with dry hay than with soft grass; that they are more difficultly habituated

tuated to a change of climate than horfes; and, for this reafon, that *oxen* defigned for labour ought never to be brought from any great diftance.

As the *oxen* are idle in winter *, they may be fed with ftraw and a little hay. But, in the labouring feafon, they fhould have more hay than ftraw, and even a little bran or oats. In winter, if the hay be fcarce, they fhould be fed with cut grafs, or rather with the young fhoots and leaves of the afh, elm, oak, &c. But of thefe laft they fhould be allowed fmall quantities only; becaufe indulgence in this kind of food, of which they are exceedingly fond, fometimes occafions a bloody urine. Lucern, faintfoine, vetches, whether green or dry, lupins, turnips, boiled barley, &c. afford them excellent nourifhment; and, as they never ufe more than is neceffary, they fhould always have as much as they will take. They fhould not be permitted to pafture till the middle of May; becaufe young herbage is too crude for them; and, though they eat it with avidity, it fometimes makes them uneafy. They fhould be paftured during the whole fummer, and, about the middle of

* Are we from this to conclude, that the oxen in France labour none during the winter? We fhould rather imagine that winter is the moft bufy feafon for ploughing there, as well as in Britain, unlefs in diftricts where the foil confifts of very ftrong clay, &c.

October,

October, they should be brought back to the stall, always taking care not to make their changes from green food to dry, or from dry to green, too rapid, but to accustom them gradually to these different kinds of aliment.

Great heat is perhaps more hurtful to these animals than great cold. During summer, they should be set to work very early in the morning, put into the stable, or left to graze under the shade of trees, in the middle of the day, and not yoked again till three or four o'clock afternoon. In spring, autumn, and winter, they may be wrought, without interruption, from eight or nine in the morning to five or six in the evening. Though they require not so much attention as the horse; yet, to keep them vigorous and healthful, they should be daily curried and washed; their hoofs should likewise be rubbed over with grease. They should also have drink, at least twice a-day. Though the horse loves muddy and lukewarm water, the ox always prefers that which is fresh and clean.

Though the cow, in general, requires the same food and management as the *ox*; yet, the milk-cow demands particular attention, both in the choice and treatment of her. It is said, that black cows give the best milk; and that white cows furnish the greatest quantity of milk. But, whatever be the colour of a milk-cow, she ought to be plump, to have lively eyes, and a lightness in her motions. She should likewise be young,

young, and give plenty of good milk. In summer, she should be milked twice a-day, and only once in winter*; and, when an increase in the quantity of milk is required, she ought to have more succulent food than herbage.

Good milk is neither too thick nor too thin. Its consistence should be such, that a small drop ought to preserve its spherical figure, without running. It should also be very white; when of a yellowish or blueish colour, it is of no value. Its taste should be sweet, without any degree of bitterness or sharpness. Its flavour should be agreeable. In the month of May, and during the summer, milk is better than in winter; and it is never perfectly good, but when the cow is of a proper age, and in good health. The milk of young heifers is too thin, and that of old cows is too thick, especially in winter. These different qualities of milk are proportioned to the quantities of oily, caseous, and serous particles it contains. Thin milk has too great a quantity of serous particles; too thick milk has the opposite quality; and milk that is too dry, has not enough of the oily and serous particles. The milk of a cow in season, or when near the end of gestation, or soon after delivery, is bad. In the third and fourth stomachs of a suckling calf, there are clots of curdled milk, which, after being dried in the air, become runnet, or

* It is a better practice to milk cows three times a-day in summer, and twice in winter.

that well known ſubſtance which coagulates milk. The longer the runnet is kept, its ſtrength increaſes, and a ſmall quantity of it is ſufficient to make a great deal of cheeſe.

Both cows and *oxen* are fond of wine, vinegar, and ſalt; and they devour a dreſſed ſallad with great avidity. In Spain, and ſome other countries, one of thoſe ſalt ſtones, called *ſalegres*, and which are found in the ſalt-mines, are placed near the young calves in the ſtable. They lick this ſtone during the time their mothers are paſturing, which excites their appetite, or creates thirſt to ſuch a degree, that, when the mothers return, the calves ſuck greedily, and, by this means, they grow and fatten much ſooner than thoſe to whom no ſalt is given. For the ſame reaſon, when *oxen* loſe their appetite, they are ſerved with graſs drenched in vinegar, or ſprinkled with ſalt. To make them fatten quickly, ſalt, as it increaſes their appetite, may alſo be adminiſtered. It is common to begin to fatten them at the age of ten years. If longer delayed, ſucceſs is not ſo certain, neither is their fleſh equally good. They may be fattened in all ſeaſons; but ſummer is preferable, becauſe leſs expence is incurred; and, by beginning in May or June, they are fit for the butcher before the end of October. Whenever we begin to fatten *oxen*, they ſhould no longer be allowed to labour. They ought to drink frequently, to have plenty of ſucculent food, ſometimes mixed

with a little falt; and they fhould be permitted to ruminate and fleep in the ftable during the heat of the day. By this treatment, in four or five months, they will be fo fat as to be hardly able to walk, or be conducted to any diftance but by very fhort journeys. Cows, and even bulls whofe tefticles have been twifted (*taureaux biftournes*), may alfo be fattened. But the flefh of the cow is drier than that of the *ox*; and the flefh of the bull, even when maimed, is red, hard, and has a ftrong difagreeable tafte.

Bulls, cows, and *oxen*, are fond of licking themfelves, efpecially when lying at their eafe. To prevent this practice, which is fuppofed to retard their fattening, it is common to befmear every part of the body they can reach with their own dung*. If this precaution be neglected, they fwallow great quantities of hair, which, being an indigeftible fubftance, remains in the ftomach, and forms a kind of balls, called *ægagropilæ*, of a fize fo confiderable as to hurt the powers of digeftion. Thefe balls, in procefs of time, are covered with a brown cruft, which, though formed of mucilage, becomes hard and polifhed. They are only found in the maw; and, if any hairs enter into the other ftomachs, or bowels, they are probably difcharged along with the fæces.

* This precaution is unneceffary; for the diforder mentioned in the text is extremely rare. Befides, it is a common notion, that licking promotes the health of cattle. It is certain, however, that licking is a mark of their beginning to get into flefh.

Animals which, like the horſe and aſs, have cutting teeth in both jaws, browſe ſhort graſs with more eaſe than thoſe that want theſe teeth in the upper jaw. The ſheep and goat, indeed, cut very cloſe, becauſe they are ſmall animals, and have thin lips. But the ox, whoſe lips are thick, can eat long graſs only. It is for this reaſon that he does no injury to the paſture on which he feeds. As he only bites off the extremities of young herbage, the roots are not diſturbed, and the growth is very little retarded. The ſheep and goat, on the contrary, cut the plants ſo cloſe to the ground, that the ſtems are deſtroyed and the roots ſpoiled. Beſides, the horſe always ſelects the ſhorteſt and moſt tender, allowing that which is longer and harder to ripen and ſhed the ſeeds. But the ox devours all the large ſtems, and gradually deſtroys the coarſer kinds of graſs. Hence, in a few years, graſs paſtured by the horſe degenerates, while the ox always improves the herbage on which he feeds *.

The domeſtic ox, which ought not to be confounded with the urus, the buffalo, or the biſon, ſeems to be a native of our temperate climates, exceſſive heat or exceſſive cold being equally

* This reaſoning has by no means the ſanction of experience. Fields paſtured by horſes or ſheep degenerate as little as thoſe paſtured by black cattle. Beſides, the roots of many of the fineſt graſſes are perennial, and thrive beſt when cloſely browſed; and ſome of the beſt graſſes grow pretty tall, and ſome of the worſt kinds never riſe high.

hurtful

hurtful to him. Besides, this species, so abundantly diffused over all Europe, is not found in the equatorial regions, and extends not, in Asia, beyond Armenia and Persia, nor, in Africa, beyond Egypt and Barbary: For, in India, the southern parts of Africa, and even America, their native cattle are either bisons, which have a protuberance on their backs, or other animals of a different species, to whom travellers have given the name of oxen. Those found at the Cape of Good Hope, and in many parts of America, were transported thither from Europe by the Dutch and Spaniards. In general, countries which are somewhat cold, seem to be more agreeable to our oxen than warm climates. They are likewise larger and taller in proportion to the moistness of the climate, and the richness of the pasture. The largest oxen are those of Denmark, Podolia, the Ukraine, and Calmuck Tartary *. Those of Britain, Ireland, Holland, and Hungary, are larger than those of Persia, Turkey, Greece, Italy, France, and Spain; and the Barbary oxen are the most diminutive. The Dutch, I am assured, bring annually from Denmark a great number of large meagre cows, which give more milk than those of France. The milk-cows, called *Lath-backs*, which are numerous in Poitou, Aunis, and the fens of Charpente, have probably been derived

* Voyage de Reynard, tom. i. p. 217. and l'Hist. Gen. des Voyages, tom. vii. p. 13.

from

from this race; for they are larger, leaner, and yield more milk and butter than the common kind. They may be milked during the whole year, except four or five days before they bring forth; but they require excellent paſture. Though they eat no more than ordinary cows, as they continue always meagre, all their ſuperfluous nouriſhment is converted into milk. But, whenever ordinary cows feed for ſome time in rich paſtures, they become fat, and ceaſe to give milk. With a bull of this race, and common cows, a baſtard kind is produced, which is more fertile in milk than the ordinary race. This baſtard race frequently bring forth two calves at a birth, and likewiſe give milk during the whole year. Cows form a part of the riches of Holland, from which conſiderable quantities of butter and cheeſe are annually exported. The Dutch cows give twice as much milk as the French cows, and ſix times more than thoſe of Barbary *.

In Ireland, Britain, Holland, Switzerland, and other northern countries, great quantities of beef are ſalted and ſmoked, both for the purpoſes of trade, and for the uſe of the navy. Theſe countries alſo export a prodigious number of hides. The ſkin of the ox, and even of the calf, are uſed for many purpoſes. The greaſe is likewiſe a ſubſtance of great utility. The dung of the ox is the beſt manure for dry and light

* See Shaw's Travels.

 ſoils.

foils. The horn of this animal afforded to men the firft inftrument for drinking, for augmenting founds, for introducing light into houfes, and for making lanthorns. It is now moulded into boxes, combs, fpoons, and other articles of manufacture. But I muft conclude; for natural hiftory ends where the hiftory of arts commences.

SUPPLEMENT.

IN Tartary and Siberia, the oxen are extremely numerous. At Tobolfki there are alfo vaft quantities of black cattle *. I formerly mentioned, that, in Ireland, both the *oxen* and cows frequently want horns: But this happens only in the fouthern parts of the ifland, and in fome maritime places, where the grafs is either fcarce, or of a bad quality; which is an additional proof, that the horns are produced by redundant nourifhment †. In places adjacent to the fea, the Irifh

* Hift. Gen. des Voyages, tom. xviii. p. 119.

† The want of horns is here afcribed to a deficiency of redundant nourifhment. In many places, there are few cattle but thofe which have no horns, and they are equally fat, and yield as much milk as any other kind, when fed in the fame paftures. The truth is, this is a diftinct breed, and may be perpetuated in any climate or foil where cattle can live, if all commixture with other kinds be prevented.

There

Irish feed their cows with fish boiled into a kind of pap; these animals are not only accustomed to this kind of food, but they are very fond of it; and, it is said, their milk is not affected with any disagreeable smell or taste *.

The cows and *oxen* of Norway are, in general, very small. In the islands along the Norwegian coast, they are somewhat larger. This difference must proceed from better pasture, and from their being allowed, in these islands, to live without restraint; for they are left at absolute liberty, with no other guides than being accompanied, in winter, with a few rams, which are accustomed to scrape the snow from the ground, and to uncover the grass both for themselves and the other cattle. Here they often become so ferocious, that they can be taken by means of ropes only. These half-wild cows give very little milk. When pasture is scarce, they eat sea-weeds, mixed with boiled fish †.

The European cattle have multiplied so prodigiously in South America, that, at Buenos-aires, and some degrees beyond it, no man thinks of appropriating them. The hunters kill thousands of them solely for the sake of their

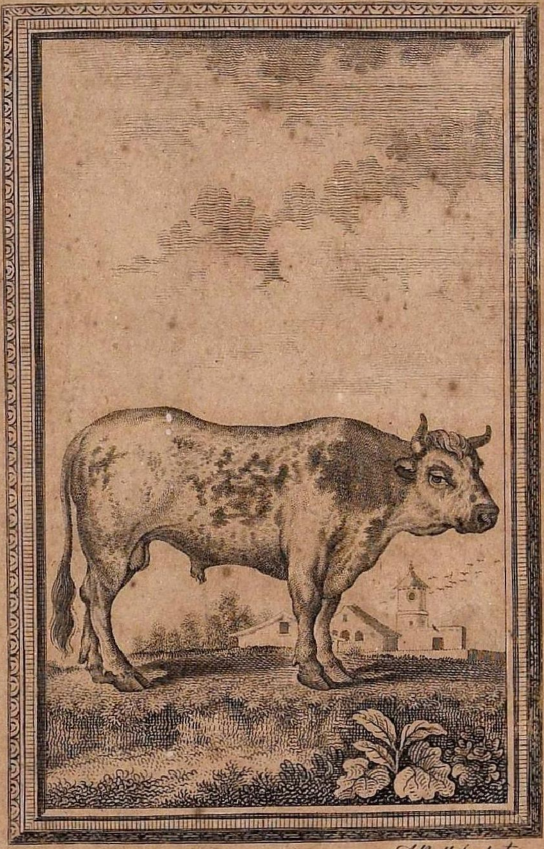
There is another variety of the ox tribe, that is not taken notice of by our author. They have short horns, which adhere not to the skull, but hang down on the forehead, to which they are connected only by a loose skinny ligament. In some places, they are called *Scurred cattle*, and continue their kind, if not allowed to intermix with other breeds.

* Hist. Gen. des Voyag. tom. xviii. p. 19.

† Pontoppidan's Nat. Hist. of Norway.

hides

Plate XIII.



A. Bell Sculpt.

BULL.

hides and tallow. They are hunted on horseback, and their purfuers either ham-ftring them, or take them in toils made of ftrong leather ftraps *. In the ifland of Saint Catharine, upon the coaft of Brazil, there are a few fmall oxen whofe flefh is flabby and difagreeable to the tafte. Both thefe defects are occafioned by bad nourifhment; for, as they have little pafture, they are chiefly fed upon wild gourds †.

In fome countries of Africa, oxen are very numerous. Between Cape Blanc and Sierra-Leona, the woods and mountains are covered with wild cows, which are generally of a brown colour, with fharp black horns. They multiply fo faft, that, if they were not perpetually hunted, both by Europeans and Negroes, their number would be infinite ‡. In the provinces of Duguela, and Tremecen, and other parts of Barbary, as well as in the deferts of Numidia, there are wild cows of a dark chefnut colour. They are very fmall, but nimble, and they go in flocks, fometimes to the number of two hundred ‖.

* Voyage du P. Lope, tom. i. p. 38.
† Ibid.
‡ Hift. Gen. des Voyages, tom. iii. p. 291.
‖ L'Afrique de Marmol, tom. iii. p. 66, 157.

THE SHEEP*.

THAT all domestic animals originally existed in a wild or savage state, seems to be an incontestible fact: The history of those already given furnishes ample proof of this position; for we still find horses, asses, and bulls, living totally independent of the human race. Can man, who has subjected so many millions of individuals, boast of having conquered and enslaved an entire species? As all animals were created without his aid, is it not reasonable to suppose, that Nature bestowed on them the faculty of existing and of multiplying without his assistance? If, however, we attend to the weakness and stupidity of the sheep; if we consider, that this helpless animal is even unable to save himself by flight; that all the carnivorous animals are not only his mortal enemies, but prefer him to every other prey; that the species are not very fertile; that the life of individuals is short, &c. we should be tempted to think, that

* The horns of the common sheep are twisted spirally and pointed outwards: There are eight cutting teeth in the lower jaw, and none in the upper; and the hoofs are cloven. *Pennant Synops.* p. 10.

Ovis aries, cornibus compressis lunatis; *Linn. Syst. Nat.* p. 97.

Ovis Plinii, lib. viii. c. xlvii. Gesner. quad. 771. Raii Syn. quad. 73.

Widder Schaaf, Klein. quad. 23.

Aries laniger cauda rotunda brevi; *Brisson. quad.* 48.

the

the ſheep was originally committed to the protection and guardianſhip of man, and that, without his aid, this animal could neither ſubſiſt nor multiply, eſpecially as no wild ſheep have ever been found in the deſerts. Wherever man has not the dominion, the lion, the tiger, and the wolf, reign by the laws of force and of cruelty. Theſe ſanguinary and rapacious animals live longer and multiply faſter than the ſheep. In a word, if our flocks, which are now ſo prodigiouſly numerous, were ſtill abandoned, the number and voracity of their enemies would ſoon annihilate the ſpecies.

It is, therefore, probable, that, without the aſſiſtance of man, the ſheep could never have ſubſiſted, or continued its ſpecies in a wild ſtate. The female is abſolutely devoid of every art, and of every mean of defence. The arms of the ram are feeble and awkward. His courage is only a kind of petulance, which is uſeleſs to himſelf, incommodious to his neighbours, and is totally deſtroyed by caſtration. The wedder is ſtill more timid than the ſheep. It is fear alone that makes ſheep ſo frequently aſſemble in troops: Upon the ſmalleſt unuſual noiſe, they run cloſe together; and theſe alarms are always accompanied with the greateſt ſtupidity*. They know

* Though the talents of the ſheep are not ſo brilliant as thoſe of ſome other quadrupeds; yet he appears not to be that ſtupid, defenceleſs, timid creature painted in the text. All tame animals loſe a portion of that ſagacity, dexterity, and

know not how to fly from danger, and seem not even to be conscious of the hazard and inconve-

and courage, which they are obliged to employ against their enemies in a wild state; because they have been long accustomed to rely upon the protection of man. Sheep, when enslaved by men, tremble at the voice of the shepherd or his dog. But, on those extensive mountains, where they are allowed to range almost without control, and where they seldom depend on the aid of the shepherd, they assume a very different mode of behaviour. In this situation, a ram or a wedder boldly attacks a single dog, and often comes off victorious. But, when the danger is of a more alarming nature, like man, they trust not to the prowess of individuals, but have recourse to the collected strength of the whole flock. On such occasions, they draw up into a compact body; they place the young and the females in the centre; and the strongest males take the foremost ranks, keeping close by each other's sides. Thus an armed front is presented on all quarters, and cannot be attacked without the greatest hazard of destruction. In this manner they wait, with firmness and intrepidity, the approach of the enemy. Nor does their courage fail them in the moment of attack: For, if the aggressor advances within a few yards of the line, the rams dart upon him with such impetuosity, as lays him dead at their feet, unless he saves himself by flight. Against the attacks of single dogs, or foxes, they are, when in this situation, perfectly secure. Besides, a ram, regardless of danger, often engages a bull, and never fails to conquer him; for the bull, by lowering his head, without being sensible of his defenceless condition, receives between his horns the stroke of the ram, which usually brings him to the ground.

In the selection of food, few animals discover greater sagacity than the sheep; nor does any domestic animal show more dexterity and cunning in its attempts to elude the vigilance of the shepherd, and to steal such delicacies as are agreeable to its palate. The boldness of the female, when not in a state of absolute slavery, in protecting her young from injury, is likewise extremely remarkable. When perfectly tamed, and rendered domestic, the sportive gambols and troublesome tricks of this animal, are too well known to require any description.

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nience of their ſituation. Wherever they are, there they remain obſtinately fixed; and neither rain nor ſnow can make them quit their ſtation. To force them to move, or to change their route, they muſt be provided with a chief, who is taught to begin the march: The motions of this chief are followed, ſtep by ſtep, by the reſt of the flock. But the chief himſelf would alſo continue immoveable, if he were not puſhed off by the ſhepherd, or by his dog, an animal which perpetually watches over their ſafety, which defends, directs, ſeparates, aſſembles, and, in a word, communicates to them every movement neceſſary to their preſervation.

Of all quadrupeds, therefore, ſheep are the moſt ſtupid, and derive the ſmalleſt reſources from inſtinct. The goat, who ſo greatly reſembles the ſheep in other reſpects, is endowed with much more ſagacity. He knows how to conduct himſelf on every emergency: He avoids danger with dexterity, and is eaſily reconciled to new objects. But the ſheep knows neither how to fly nor to attack: However imminent her danger, ſhe comes not to man for aſſiſtance ſo willingly as the goat; and, to complete the picture of timidity and want of ſentiment, ſhe allows her lamb to be carried off, without attempting to defend it, or ſhowing any marks of reſentment. Her grief is not even ex-

preſſed by any cry different from that of ordinary bleating *.

But this animal, ſo contemptible in itſelf, and ſo devoid of every mental quality, is of all others the moſt extenſively uſeful to man. From the ſheep we are at once ſupplied both with food and clothing, without mentioning the particular advantages derived from the milk, the fat, the ſkin, the bowels, the bones, and the dung. To this animal, Nature ſeems to have given nothing that redounds not to the immediate advantage and convenience of man.

Love, which, in animals, is the moſt active and moſt general ſenſation, ſeems to be the only one that communicates vivacity to the ram. When under the influence of this paſſion, he

* This is another heavy charge againſt the character of the ſheep. But every perſon who has attended to theſe animals, at leaſt in this country, muſt know that the accuſation is not altogether juſt. Individuals, in a ſtate of ſubjection, ſeem to have no idea of reſiſting the attacks of an enemy. But they ſoon learn that their protection lies in the ſhepherd or his dog; for, when it becomes neceſſary, in Britain, to watch the folds, in order to prevent aſſaults from foxes or dogs, upon the firſt alarm, the whole flock run with violence to the place where the watchmen are ſtationed: ſo that, when they chance to ſleep, they are often hurt by the ſheep trampling upon them. On other occaſions they never chooſe to make a very cloſe approach either to men or dogs; but the ſenſe of immediate danger makes them forget their uſual timidity, and their ſagacity teaches them where their ſafety lies. When the female is robbed of her lamb, ſhe bleats in a manner that ſtrongly marks the anguiſh ſhe feels. In the eagerneſs of her ſearch, her eye-balls ſeem to ſtart from their ſockets; and her irregular and diſtracted motions, joined to the violence and conſtancy of her bleatings, are evident indications of the moſt pungent grief.

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becomes petulant, fights, and sometimes even attacks the shepherd. But the ewe, though in season, discovers not the smallest emotion: Her instinct extends no farther than not to refuse the approaches of the male, to choose her food, and to distinguish her own offspring from those of the rest of the flock. The perfection, or certainty of instinct, always augments in proportion to the mechanism, or innateness of the cause by which it is produced *. A young lamb, in the midst of the most numerous flocks, searches for, and discovers its mother, without ever once committing a mistake. It has been alleged, that sheep are susceptible of the pleasures of music; that they feed with more appetite, have better health, and fatten sooner, by the sound of the pipe. But the remark is more probable, that music serves only to amuse the shepherd, and that the origin of the art was derived from this solitary and inactive kind of life.

These animals, so simple and dull in their intellect, are likewise very feeble in their constitution. They cannot continue long in motion: Travelling weakens and extenuates them. When

* Here, and in many other places, the principles of materialism make the Count de Buffon express his sentiments obscurely. It would have been more intelligible, and more consonant to truth, if he had said, 'That the instincts of any particular animal are always stronger, in proportion to the smallness of their number.' The sheep has few instincts; and, therefore, as there is less danger of being distracted by a variety of motives to action, the animal is led with greater certainty to the purposes intended by Nature.

they run, they pant, and ſoon loſe their breath. The ardour of the ſun is equally incommodious to them as moiſture, froſt, and ſnow. They are ſubject to many diſeaſes, moſt of which are contagious. A redundancy of fat often kills them, and always renders the ewes barren: They bring forth with difficulty, frequently miſcarry, and require more care than any other domeſtic animal *.

When the ewe is about to bring forth, ſhe ſhould be ſeparated from the reſt of the flock, and watched, in order to be ready to aſſiſt her in delivery. The lamb frequently preſents croſsways, or by the feet. In ſuch caſes, if not aſſiſted, the mother's life is in great danger. When ſhe is delivered, the lamb ſhould be raiſed on its feet, and the milk ſhould be drawn from the paps of the mother. As this firſt milk is bad †, and would be hurtful to the lamb, it ſhould not

* This is unqueſtionably another exaggeration. The ſheep, when nearly in a wild ſtate, is a robuſt, active animal, and capable of enduring much fatigue without injury. But, when immerſed in luxury, and pampered in rich paſtures, like creatures of a higher nature, the ſheep becomes overloaded with fat, and contracts unnatural diſeaſes. Beſides, no tamed animal requires or receives leſs aſſiſtance in bringing forth its young.

† It is difficult to conceive that Nature ſhould prepare a fluid for the nouriſhment of young animals, which, inſtead of being ſalutary, ſhould, in the moſt critical period of their exiſtence, be noxious to them. Such opinions require the ſupport of facts; for, in this country, no lambs thrive ſo well as thoſe which are left entirely to the care of the dam. In caſes of preternatural labour, or when the mother is much debilitated, aſſiſtance is unqueſtionably neceſſary; but caſes of this kind are not common.

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be permitted to ſuck till a freſh ſtock has accumulated. The lamb is kept warm, and ſhut up for three or four days with the mother, that it may learn to know her. To recover the ſtrength of the ewe, ſhe ſhould be fed, for ſome time, with good hay, grinded barley, or bran mixed with a little ſalt. Her water ſhould be lukewarm, and whitened with the flour of wheat, beans, or millet. At the end of four or five days, ſhe may be allowed to return, by degrees, to her ordinary mode of living, and to paſture among her neighbours*; but, to prevent the milk from being chaffed, ſhe ſhould not be conducted to any great diſtance. Some time after, when the lamb has acquired ſtrength, and begins to friſk about, it may be allowed to follow its mother to the fields.

All the lambs which have the appearance of feebleneſs, are generally ſent to the butcher; and thoſe only are kept which are moſt vigorous, largeſt, and beſt covered with wool. Lambs of the firſt litter are never ſo good as thoſe of ſucceeding litters. When we want to rear lambs which are brought forth in the months of October, November, December, January, or February, they are kept in the ſtable, and only allowed to go out to ſuck every morning and

* In thoſe parts of Britain where the beſt ſheep are bred, they are never houſed, nor, during the lambing-ſeaſon, have any thing adminiſtered to them but their ordinary paſture. When in health, ſheep have no occaſion for water. In our northern climates, it is even injurious to them.

evening, till the beginning of April. Some time before this laſt period, they are fed with a little graſs every day, to accuſtom them to their new ſpecies of nouriſhment. They may be weaned when a month old; but it is better to ſuckle them ſix weeks or two months. White lambs are always preferred to thoſe which are black or ſpotted; becauſe white wool gives a higher price than that of any other colour.

In the temperate weather of ſpring or autumn, the lambs may be caſtrated at the age of five or ſix months, or even a little later *. There are two methods of performing this operation. The teſticles are either removed by inciſion, or the veſſels which terminate in them are deſtroyed by a ſtrait ligature. Caſtration renders lambs ſick and melancholy. To prevent the diſguſt which ſucceeds, they ſhould have bran mixed with ſalt for two or three days.

At the age of twelve months, rams, ewes, and wedders, loſe the two fore-teeth of the under jaw: Six months after, the two neighbouring teeth likewiſe fall out; and, at three years of

* The ſooner lambs are caſtrated, the operation is attended with the leſs danger. But there is always a neceſſity for delaying it till the teſticles fall down into the ſcrotum, which ſometimes happens not till they are ſeveral weeks, or even ſome months old. There are examples where only one of the teſticles deſcends. In caſes of this kind, though the teſticle that has come down be cut off, and the animal cannot be diſtinguiſhed from a wedder; yet he ſtill retains the power of procreating. In Scotland, ſheep of this kind are called *wrigglings*.

age, they are all replaced, and are then equal and pretty white. But, in proportion as the animal increases in years, the teeth begin to lose their enamel, and become blunt, unequal, and black. The age of the ram may be known by his horns, which appear the first year, and often at birth, and have a fresh ring added to them every year that he lives. Ewes seldom have any horns; but, in place of them, they have two bony protuberances. Some ewes, however, have two, and even four horns. These ewes are every way similar to the common kind; and their horns are from five to six inches long, and less twisted than those of the ram. When ewes have four horns, the two anterior ones are shorter than the other two. The ram is capable of generating in 18 months, and the ewe can produce when a year old. But it is better to prevent all communication between them till the ewe be two years of age, and the ram three. The young produced at more early periods, and even the first productions of these animals, are always feeble and ill conditioned. One ram is more than sufficient to serve 25 or 30 ewes *. The ram should always be selected from the strongest and most handsome of his species. He should be garnished with horns; for hornless rams, of which there are some in our climates, are less

* A ram has been often known to beget one hundred lambs in a single season:

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vigorous and less proper for propagating *. A good and beautiful ram should have a strong thick head, a wide front, large black eyes, a flat nose, big ears, a thick neck, a long high body, a large crupper and reins, massy testicles, and a long tail. The best rams for breeding are those which are of a white colour, well covered with wool upon the belly, the tail, the head, the ears, and as far as the eyes. Ewes, whose wool is most abundant, most bushy, largest, most silky, and whitest, are always to be preferred, especially if, at the same time, they are large, have thick necks, and walk nimbly. It has also been remarked, that those which are rather meagre than fat, are the best breeders.

The season of ewes is from the beginning of November to the end of April. However, when nourished with stimulating food, as bread made of hemp-seed, and salted water, they conceive at any time †. Ewes are allowed to be covered three

* There are many breeds of sheep, in which both males and females want horns; yet they are as vigorous as any of the species. The largest and finest sheep in England have no horns. In some counties, the inhabitants are perfectly unacquainted with horned sheep. In other places, a sheep without horns is as great a rarity as one with four or six horns.

† In this climate, ewes fed in good pastures admit the ram in July or August; but September and October are the months when the greatest part of our ewes, if left to Nature, take the ram. Neither is it customary, at this season, to give them dry food; nor would such a practice be possible in large flocks. When the object is to force Nature prematurely, some stimulating

three or four times; after which they are ſeparated from the rams, who prefer the aged ewes, and deſpiſe thoſe that are younger. During the rutting ſeaſon, ewes ſhould not be expoſed to rainy or ſtormy weather; for moiſture prevents conception, and a clap of thunder often produces an abortion. A day or two after copulating, they are allowed to return to their ordinary mode of living; for, if the uſe of ſalted water, hemp-ſeed bread, and other ſtimulating food, were continued, they would infallibly miſcarry. They carry five months, and bring forth in the beginning of the ſixth. They generally produce one lamb, but ſometimes two. In warm climates, they can produce twice a-year; but, in France, and in colder climates, only once. To have lambs in the month of January, the ram is admitted to the ewes towards the end of July, or beginning of Auguſt. Thoſe which are covered in September, October, and November, produce in February, March, and April. We may alſo have plenty of lambs in May, June, July, Auguſt, and September; and they only become rare in October, November, and December. The ewes give milk abundantly for ſeven or eight months. This milk affords pretty good nou-

ing food may, perhaps, have the deſired effect. It is more common, however, to retard the ſeaſon of general copulation, by ſeparating the rams from the ewes, than to forward it. The rule is, to admit the ram at ſuch a time as will bring the ewes to lamb when there will be plenty of food for them; for, if they bring forth before the graſs is good, the lambs become poor and feeble.

riſhment to children and country-people *. It makes very good cheeſe, eſpecially when mixed with cow-milk. The time of milking ewes is immediately before they go out to the field, or ſoon after their return. In ſummer they may be twice milked every day, and once in winter.

Ewes, when with young, grow fat; becauſe they then eat more than at any other period. As they frequently hurt themſelves, and miſcarry, they ſometimes become barren, and ſome of them produce monſters. However, when properly managed, they bring forth during life, *i. e.* for ten or twelve years; but they are generally old and uſeleſs at the age of ſeven or eight years. The ram, who lives twelve or fourteen years, becomes unfit for propagating when eight years old. He ſhould then be caſtrated, and fattened along with the old ewes. The fleſh of the ram, even after being caſtrated and fattened, has always a diſagreeable taſte: That of the ewe is flabby and inſipid. But the fleſh of the wedder furniſhes the moſt ſucculent and beſt of all our common diſhes.

When men want to form a flock with a view to profit, they purchaſe ewes and wedders at the age of eighteen months, or two years, and a hundred of theſe might be managed by a ſingle ſhepherd †. If vigilant, and aided by a good

* The milk of ewes, in its natural ſtate, is nauſeous, and ſeldom uſed in this country. We uſually convert it into cheeſe.

† In an open country, and extenſive paſture, a good ſhepherd, aſſiſted by his dog, will manage, with eaſe, ten times the number mentioned in the text.

dog, he will loſe very few of them. When conducting them to the fields, he ought to go before, accuſtom them to the ſound of his voice, and to follow him without ſtopping, or going aſide among the corn, or the vines, where they commit great devaſtation. The ſea-coaſts, or plains on the top of hills, afford them the beſt paſture. But low, moiſt, and marſhy grounds, ſhould always be avoided. During winter, they are fed, in the ſtable, with bran, turnip, hay, ſtraw, lucern, ſaintfoine, aſh and elm leaves, &c. When the weather is not very bad, they ſhould be allowed, chiefly for the ſake of exerciſe, to go out every day. In this cold ſeaſon, they are not led to the fields before ten in the morning, where they remain for four or five hours; after which they are made to drink, and are conducted back about three o'clock after noon. In ſpring and autumn, on the contrary, they are led out as ſoon as the ſun has diſſipated the moiſture or hoar-froſt, and are not brought back till ſun-ſet. In theſe two ſeaſons it is ſufficient to make them drink once a-day, and immediately before they return to the ſtable, where they muſt always have forage, but in ſmaller quantity than during winter. It is only in ſummer that they ought to feed entirely in the fields, where they are conducted twice a-day, and alſo made to drink twice. They are brought out at day-break, allowed to feed four or five hours, and, after drinking, are led back to the fold, or ſome

other

other ſhady place. About three or four o'clock after noon, when the exceſſive heat begins to diminiſh, they are again paſtured till night comes on. Were it not for the ravages of the wolf, they ought to remain in the field during the whole night, as is practiſed in Britain, which would make them both more vigorous and more healthful. As the rays of the ſun, when very warm, are apt to affect theſe animals with a vertigo, they ſhould always be paſtured with their heads turned from the ſun, ſo that the body may form a kind of ſhade to defend the head. Laſtly, to preſerve their wool, they ſhould not be allowed to feed among thorns, briars, thiſtles, &c.

In dry elevated grounds, where the wild thime and other odoriferous plants abound, the fleſh of the ſheep is of a better quality than when fed in low moiſt plains. But ſandy downs on the ſea-coaſt produce the beſt mutton, becauſe the herbage is ſaltiſh; and nothing improves the reliſh of mutton ſo much as paſture of this kind: Beſides, it gives an agreeable ſavour to the milk of the ewe, and increaſes its quantity. Theſe animals are extremely fond of ſalt, and, when given in moderate quantities, it is very ſalutary. In ſome places, a bag of ſalt, or a ſalt-ſtone, is put into the fold, which the creatures lick alternately.

Every year, thoſe which begin to grow old, ſhould be ſeparated from the flock, for the purpoſe of fattening, becauſe then a different management

nagement is neceſſary: If in ſummer, they ſhould be conducted to the field before ſun-riſing, that they may feed upon graſs moiſtened with dew. Nothing contributes more to fatten wedders than water taken in great quantities; and nothing retards their fattening more than the heat of the ſun. For this reaſon, they ſhould be put into the fold or ſhade at eight or nine o'clock in the morning, before the heat becomes too violent; and they ought to have a little ſalt, in order to excite their appetite for water. They ſhould be led out a ſecond time, about four o'clock after noon, to freſh and moiſt paſtures. By this treatment, they acquire, in two or three months, all the appearances of being fleſhy and fat. But this fat, which originates from the great quantities of water drunk by the animal, is only a kind of purſy ſwelling, and would ſoon occaſion the rot, if not prevented by killing them immediately after they acquire this fallacious appearance. Even their fleſh, inſtead of being firm and juicy, is frequently very looſe and inſipid. To produce good mutton, beſide the treatment above recommended, the animals ſhould have better nouriſhment than graſs. In winter, and indeed in all ſeaſons, they may be fattened by keeping them in ſtables, and feeding them with the flour of barley, oats, wheat, beans, &c. mixed with ſalt, to increaſe their appetite for drink. But whatever mode be followed, it ſhould be executed as quickly as poſſible: for they cannot be fattened a ſecond

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time*, most of them dying of diseases in the liver

Worms are frequently found in the livers of animals: A description of those of the wedder and ox may be seen in the Journal des Sçavans †, and in the German Ephimerides ‡. It was formerly imagined, that these worms were peculiar to ruminating animals: But M. Daubenton discovered the same species in the liver of the ass; and it is probable they exist in several other quadrupeds. Butterflies, it has likewise been said, are sometimes found in the liver of the wedder. M. Rouille communicated to me a letter from M. Gachet de Beaufort, physician at Montiers, of which the following is an extract: 'It is an old remark, that our Alpine wedders, 'which are the best in Europe, sometimes suddenly lose their flesh; that their eyes turn white 'and gummy; that their blood grows serous, 'having hardly any red globules; that their 'tongues are parched; and that their noses are 'stuffed with a yellow purulent mucus: Though 'the creatures continue to eat plentifully, these 'symptoms are accompanied with extreme debility, and at last terminate in death. From repeated dissections, it has been discovered, that 'the animals had always butterflies in their livers. These butterflies were white, and furnished with wings; and their heads were

* This is not true; for sheep, like other animals, may occasionally lose and regain the fat they had formerly acquired.

† Année 1668. ‡ Tom. v. Années 1675, and 1676.

'nearly

'nearly oval, hairy, and about the ſize of thoſe 'of the ſilk-worm fly. Above ſeventy, which I 'ſqueezed out of the two lobes, convinced me of 'the truth of this fact. The convex part of the 'liver was alſo in a mangled condition. The 'butterflies are found in the veins only, and ne-'ver in the arteries. Small butterflies, and like-'wiſe ſmall worms, have been diſcovered in the 'cyſtic duct. The vena portarum and capſala 'Gliſſonii were ſo ſoft, as to yield to the ſlighteſt 'touch. The lungs, and other viſcera, were 'ſound,' &c. If Dr. Gachet de Beaufort had been more particular in his deſcription of theſe butterflies, he might, perhaps, have removed the ſuſpicion, that the animals he ſaw were only the common worms found in the liver of the ſheep, which are very flat, broad, and of a figure ſo ſingular, as to appear, at firſt ſight, to be rather leaves than worms.

The wool of the ſheep is ſhorn every year. In warm countries, where no danger ariſes from making the animal quite bare, they do not ſheer the wool, but tear it off; and this operation is performed twice a-year. But, in France, and in colder climates, the fleece is ſhorn only once a-year, and a part of it is allowed to remain, in order to protect the animal from the inclemency of the weather*. The operation is performed in

* The fleece of the ſheep, like the fur of moſt other quadrupeds, looſens from the ſkin in the beginning of ſummer, and, if permitted, would fall, of its own accord, from the animal's body. To

in the month of May, after washing the sheep, to render the wool as clean as possible. The month of April is too cold; and, if delayed till June or July, the wool does not grow sufficiently long to protect the animal from the cold of winter. The wool of the wedder is generally better, and in greater quantity, than that of the ewe or ram. The wool upon the neck, and about the top of the back, is of a better quality than that upon the thighs, the tail, the belly, &c. and that taken from dead or diseased animals, is the worst. White wool is preferred to gray,

To prevent the waste which would ensue, the farmer sheers his sheep before the fleeces become altogether loose. If the operation be longer delayed, the fleece breaks and falls off in detached pieces. Thus the proper season for sheering sheep is determined by Nature. When the young fleece begins to grow, it pushes the old one before it, which becomes loose at the root, and the sheep, after the operation, remains covered with close short wool. When sheep are shorn before the young fleece has begun to grow, they are left too bare, and are in danger of catching cold. Besides, that part of the old fleece which is left on the animal, is entirely lost. If, on the other hand, the operation be delayed till the young fleece has grown so long as to mix with the old one, a part of the former will be cut off, which, by being too short, is not only perfectly useless in manufactures, but injures the long wool among which it is blended. For these reasons, a skilful farmer sheers not all his sheep indiscriminately at the same time, but occasionally as the fleeces become ripe.

It was formerly the practice, instead of sheering, to pluck the wool from the sheep. But, though it might be done at different times, as parts of the fleece loosened, without giving the animal any pain; yet the practice is slovenly, incompatible with the management of large flocks, and often attended with a considerable loss of wool.

brown, or black, because it is capable of being dyed any colour; and smooth sleek wool is better than that which is curled. It is even alledged, that wedders, whose wool is curled, are not so good as the others.

Land may be much improved by folding sheep: For this purpose a piece of ground is inclosed, and the flock shut up in it every night during the summer-season. The dung, urine, and heat of the animals, soon meliorate exhausted, cold, or barren grounds. A hundred sheep, in one summer, will fertilize eight acres of land for six years.

It has been remarked by the ancients, that all ruminating animals have suet: But this remark, strictly speaking, holds only with regard to the sheep and goat: The suet of the wedder is more copious, whiter, drier, firmer, and better than that of any other animal. Fat or grease is very different from suet, the former being always soft, while the latter hardens in cooling. The greatest quantity of suet is found about the kidneys; and the left kidney furnishes more than the right. There are also considerable quantities in the epiploon or web, and about the intestines; but it is not near so firm or good as that of the kidneys, the tail, and other parts of the body. Wedders have no other grease but suet; and this matter is so prevalent in their bodies, that their whole flesh is covered with it. Even the blood contains a considerable quantity of

of ſuet; and the ſemen is ſo charged with it, as to give that liquor a different appearance from that of other animals. The ſemen of men, of the dog, horſe, aſs, and probably of every animal which affords not ſuet, diſſolves with cold; or when expoſed to the air, becomes more and more fluid from the moment it eſcapes from the body. But the ſemen of the ram, and perhaps of every animal that has ſuet, hardens and loſes its fluidity with its heat. I remarked this difference when examining theſe liquors with the microſcope: That of the ram fixes a few ſeconds after coming from the body; and, in order to diſcover the living organic particles, of which it contains prodigious numbers, its fluidity muſt be preſerved by the application of heat.

In the ſheep, the taſte of the fleſh, the fineneſs of the wool, the quantity of ſuet, and even the ſize of the body, vary greatly in different countries. In France, the province of Berri abounds moſt in ſheep. Thoſe about Beauvais, and in ſome other parts of Normandy, are fatter and more charged with ſuet. They are very good in Burgundy; but the beſt are fed upon the ſandy downs of our maritime provinces. The Italian, Spaniſh, and even the Engliſh wools, are finer than the French wool. In Poitou, Provence, the environs of Bayonne, and ſeveral other parts of France, there is a race of ſheep which have the appearance of being foreign. They are larger, ſtronger, and better

Plate XIV.

A Bell Sculpt.

RAM

Plate XV.

A Bell Sculpt.

EWE

better covered with wool than the common kind. They are likewiſe more prolific, producing frequently two lambs at a time. The rams of this race engender with the common ewes, and produce an intermediate kind. In Italy, and in Spain, there are a great variety of races; but they ought all to be regarded as of the ſame ſpecies with our common ſheep, which, though ſo numerous and diverſified, extend not beyond Europe. Thoſe animals with a long broad tail, ſo common in Aſia and Africa, and which are called Barbary ſheep by travellers, appear to be a ſpecies different from the ordinary kind, as well as from the Pacos and Lama of America.

As white wool is moſt valued, black or ſpotted lambs are generally ſlaughtered. In ſome places, however, almoſt all the ſheep are black; and black lambs are often produced by the commixture of white rams with white ewes. In France, there are only white, brown, and black, and ſpotted ſheep: But, in Spain, there is a reddiſh kind; and, in Scotland, there are ſome of a yellowiſh colour. But all theſe varieties of colour are more accidental than thoſe produced by different races, which, however, proceed from the influence of climate, and the difference of nouriſhment.

SUPPPLEMENT.

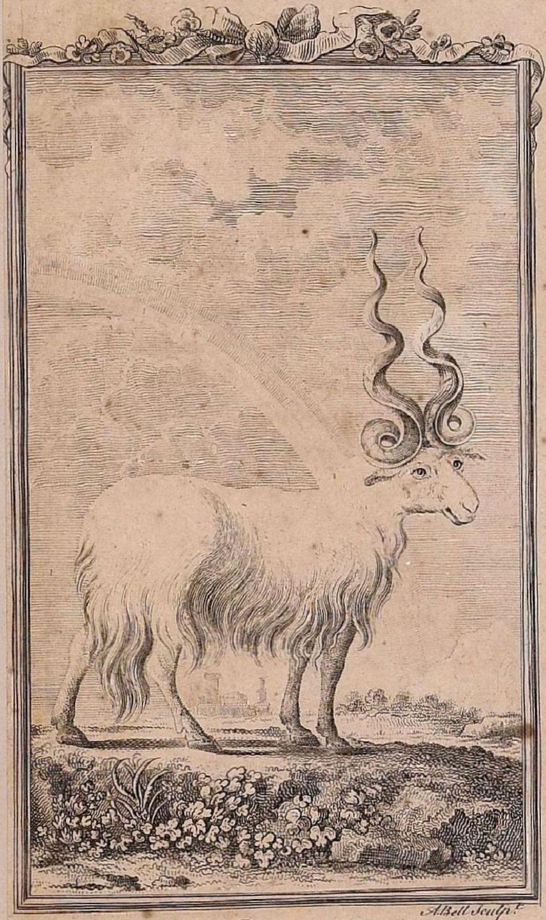
I HERE give figures of a ram and ewe, of which drawings were ſent me by the late Mr. Colinſon, fellow of the Royal Society of London, under the names of the *Walachian ram and ewe*. As this learned Naturaliſt died ſoon afterwards, I could not diſcover whether theſe ſheep, whoſe horns are extremely different from thoſe of the ordinary kind, be common in Walachia, or whether they are only an accidental variety.

In the northern parts of Europe, as Denmark and Norway, the ſheep are not good; but, to improve the breed, rams are occaſionally imported from England. In the iſlands adjacent to Norway, the ſheep remain in the fields during the whole year; and they become larger and produce finer wool than thoſe which are under the care and direction of men. It is alledged, that thoſe ſheep, which enjoy perfect liberty, always ſleep, during the night, on that ſide of the iſland from whence the wind is to blow next day. This natural indication of the weather is carefully attended to by the mariners *.

The rams, ewes, and wedders of Iceland, differ chiefly from ours, by having larger and thicker horns. Some of them have three, four, and

* Pontoppidan's Nat. Hiſt. of Norway.

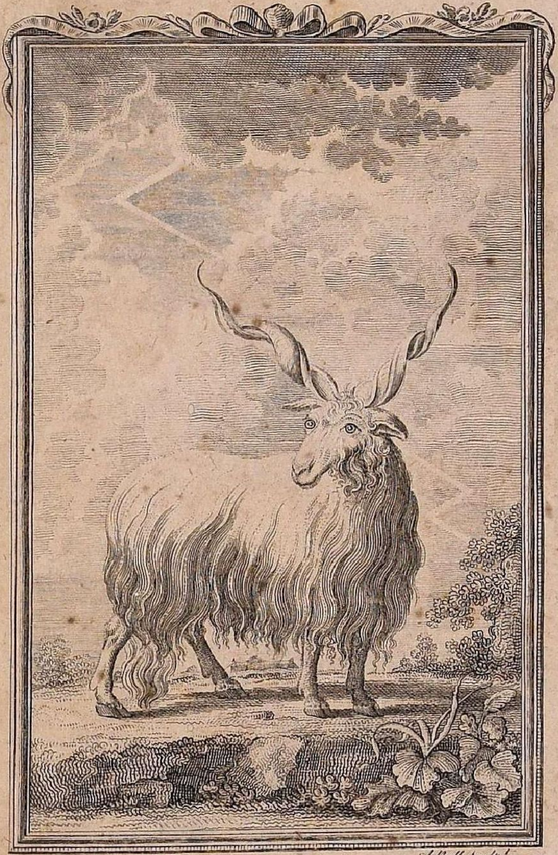
Plate XVI.



A. Bell Sculp.t

WALLACHIAN RAM

Plate XVII.



A. Bell Sculpt.

WALLACHIAN EWE

even five horns. But this peculiarity of having more horns than two, must not be considered as common to the whole race of Iceland sheep; for, in a flock of four or five hundred, hardly three or four wedders can be found with four or five horns, and these are sent to Copenhagen as rarities. As a farther proof of their being scarce, they give a higher price in Iceland than the common kind *.

* Hist. Gen. des Voyages, tom. xviii. p. 19.

THE GOAT*.

THOUGH the ſpecies of animals are ſeparated from each other by an interval, which Nature cannot overleap; yet ſome ſpecies approach ſo near to others, and their mutual relations are ſo numerous, that ſpace is only left for a bare line of diſtinction. When we compare theſe neighbouring ſpecies, and conſider them in relation to ourſelves, ſome appear to hold the firſt rank for utility, and others ſeem to be only auxiliary ſpecies, which might, in many reſpects, ſupply the place of the firſt. Thus the aſs might nearly ſupply the place of the horſe, and the goat that of the ſheep. The goat, like the ſheep, affords both milk and ſuet in conſiderable quantities. His hair, though coarſer than wool, is capable of being made into very good cloth; his ſkin is more valuable than that of the ſheep; and the fleſh of the kid makes a near approach

* The horns of the goat bend backward, and are almoſt cloſe at their baſe. There are eight cutting teeth in the lower jaw, and none in the upper. The hoofs are cloven; and the male is generally furniſhed with a beard.

Capera. Geſner. Quad. 266. Raii Syn. Quad. Aldr. Biſulc. 635.

Capra hircus, cornibus carinatis, arcuatis, gula barbata. *Lynn. Syſt.* 94. *Faun. Suec.* 44.

Siegen bock, ſiege, Klein. Quad. 15.

Le Bouc, La Chevre, Briſſon. Quad. 38. Goat. Brit. Zool. I. 29.

to

to that of the lamb, &c. These auxiliary species are more rustic and robust than the principals: The ass and the goat require not near so much attention as the horse and the sheep. They every where find the means of subsistence, eating almost indiscriminately the grossest as well as the most delicate plants. They are less affected by the influence of climate, and can better dispense with the aid of man. The less they depend on us, the more they seem to belong to Nature; and, instead of regarding these subaltern species as degenerated productions of the principal species, instead of considering the ass as a degenerated horse, it would be more consonant to reason, to say, that the horse is an improved ass; that the sheep is a more delicate kind of goat, which we have trained, raised to greater perfection, and propagated for our own use; and, in general, that the most perfect species, especially among domestic animals, derive their origin from those wild and less perfect kinds which make the nearest approach to the former. The powers of Nature, when united to those of man, are greatly augmented.

Independent of reasonings of this kind, the goat is a distinct species, and perhaps still farther removed from the sheep than the ass from the horse. The buck as willingly copulates with the ewe, as the jack-ass with the mare; and the ram embraces the she-goat in the same manner as the horse intermixes with the she-ass. But

though these commixtures be frequent, and sometimes prolific, no intermediate species has been formed between the goat and the sheep. The two species are distinct, and still remain at the same distance from each other. No change has been effected by these mixtures; they have given rise to no new or middle race of animals. They have only produced individual differences, which have no influence on the unity of each primitive species, but, on the contrary, confirm the reality of their characteristic and essential distinction.

In many cases, however, we cannot distinguish these characteristic differences with sufficient certainty: In others, we are obliged to suspend our judgment; and, in the greatest number, we have not a single ray of light to direct us: For, independent of the uncertainty arising from the contradictory testimonies with regard to historical facts; independent of the doubts resulting from the inaccuracy of those who have endeavoured to study Nature, the greatest obstacle to the advancement of knowledge proceeds from our ignorance of many effects which time alone has not been able to exhibit, and which will not be discovered even by posterity, without numberless experiments, and the most accurate investigation. In the mean time, we wander in darkness, perplexed between probabilities and prejudices, ignorant even of possibilities, and every moment confounding the opinions of men with the operations of Nature. Examples are innu-

merable;

merable: But, without leaving our fubject, we know that the he-goat and ewe, and the ram and fhe-goat, procreate together: We have ftill to learn, however, whether the mules produced by thefe commixtures be barren or fruitful. Becaufe mules produced by the mixture of the horfe with the fhe-afs, or the jack-afs with the mare, are fterile, we conclude that mules of every kind muft likewife be deprived of the power of tranfmiffion. But this opinion may be falfe. The ancients affert pofitively, that the mule produces at the age of feven years; and that it likewife produces with the mare*. They tell us, that the fhe-mule is capable of conception; but that fhe is unable to bring her fruit to perfection †. The truth of thefe facts, which obfcure the real diftinctions of animals, as well as the theory of generation, fhould be either confirmed or deftroyed. Befides, though we had a diftinct knowledge of all the fpecies of animals around us, we are ftill ignorant of what might be produced by intermixtures with each other, or with foreign animals. We have no proper information concerning the jumar, an animal faid to be produced by the cow and jack-afs, or by the mare and bull. We know not whether the zebra can produce with the horfe or afs, or the

* Mulus feptennis implere poteft, et jam cum equa conjunctus hinnum procreavit; *Arift. Hift. Animal. lib.* vi. *cap.* 14.

† Itaque concipere aliquando mula poteft, quod jam factum eft; fed enutrire atque in finem perducere non poteft. Mas generare interdum poteft. *Id. lib.* ii. *cap.* 6.

broad-

broad-tailed Barbary ram with the common ewe; whether the chamois goat be only the common goat in a wild ſtate, and whether an intermediate race might not be formed by their mixture; whether the monkeys really differ in ſpecies, or whether they form but one ſpecies, diverſified, like that of the dog, by a great number of different races; whether the dog can produce with the fox and the wolf, the ſtag with the cow, &c. Our ignorance of all theſe facts is almoſt invincible; for the experiments neceſſary to aſcertain them would require more time, attention, and expence, than the life or fortune of moſt men can permit. I employed ſeveral years in making trials of this kind, of which an account ſhall be given when I treat of mules. But, in the mean time, I acknowledge, that they afforded me very little information, and that moſt of my experiments were abortive.

Upon the determination of theſe and ſimilar facts, however, our knowledge of the diſtinction of ſpecies, and of the genuine hiſtory of animals, as well as the manner of treating them, chiefly depends. But, ſince we are deprived of this neceſſary knowledge; ſince it is impoſſible, for want of facts, to eſtabliſh analogies, or to lay a proper foundation for reaſoning, there is no other method left us, than to proceed ſtep by ſtep, to conſider each animal individually, to regard as different ſpecies all thoſe which ſpontaneouſly procreate together, and to write their hiſtory in detached

detached articles, reſerving a power of uniting or ſeparating them, as ſoon as we ſhall acquire a more perfect knowledge, either from our own experience, or that of other men.

It is for this reaſon, that, though there are many animals which reſemble the ſheep and goat, we here confine ourſelves entirely to the domeſtic kinds. We know not whether the foreign kinds could intermix with the common ſpecies, and produce new races. We are, therefore, authoriſed to conſider them as diſtinct ſpecies, till ſufficient evidence is procured, that the foreign kinds can procreate with the common, and produce fertile individuals: This is the only character which conſtitutes the reality of what is called *ſpecies* both in the animal and vegetable kingdoms.

The goat is ſuperior to the ſheep both in ſentiment and dexterity. He approaches man ſpontaneouſly, and is eaſily familiarized. He is ſenſible of careſſes, and capable of a conſiderable degree of attachment. He is ſtronger, lighter, more agile, and leſs timid than the ſheep. He is a ſprightly, capricious, wandering, laſcivious animal. It is with difficulty that he can be confined to a flock. He loves to retire into ſolitude, to climb ſteep and rugged places, to ſtand and even to ſleep on the point of rocks, and the edges of the moſt frightful precipices. The female anxiouſly ſearches for the male; and they unite with ardour. They are robuſt and eaſily nouriſhed;

for they eat almoſt every herb, and are injured by a very inconſiderable number. The bodily temperament of the goat, which, in all animals, has a great influence on the natural diſpoſitions, is not eſſentially different from that of the ſheep. These two animals, whoſe internal organization is almoſt entirely ſimilar, are nouriſhed, grow, and multiply in the ſame manner; and their diſeaſes are the ſame, except a few to which the goat is not ſubject. The goat fears not, like the ſheep, too great a degree of heat. He chearfully expoſes himſelf to the ſun, and ſleeps under its moſt ardent rays, without being affected with a vertigo, or any other inconveniency. He is not afraid of rain or ſtorms; but he appears to feel the effects of ſevere cold. The external actions and movements of animals, which, as formerly remarked, depend more upon the ſtrength and variety of their ſenſations, than the ſtructure of their bodies, are, for this reaſon, more vivacious, and leſs limited in the goat, than in the ſheep. The inconſtancy of the goat's diſpoſition is marked by the irregularity of his actions. He walks, ſtops ſhort, runs, leaps, approaches, retires, ſhows, and conceals himſelf, or flies off, as if he were actuated by mere caprice, and without any other cauſe than what ariſes from an eccentric vivacity of temper. The ſuppleneſs of his organs, and the ſtrength and nervouſneſs of his frame, are hardly ſufficient to

ſupport

support the petulance and rapidity of his natural movements.

That these animals are naturally friends to man, and that, even in uninhabited countries, they betray no savage dispositions, is apparent from the following fact. In the year 1698, an English vessel having put into the island of Bonavista, two Negroes came aboard, and offered *gratis* to the captain as many goats as [illegible]ed. The captain having expressed his astonishment at this offer, the Negroes replied, that there were only twelve persons on the island; that the goats had multiplied so greatly as to become extremely troublesome; and that, instead of being caught with difficulty, they obstinately followed the men, like other domestic animals*.

The male is capable of engendering when he is a year old, and the female when she is seven months. But the fruits of such premature embraces are feeble and imperfect; and, for this reason, they are generally restrained till they arrive at the age of eighteen months or two years. The he-goat is a beautiful, vigorous, and ardent animal. In the course of two or three months, one male is sufficient for more than 150 females. But this ardour, which soon consumes him, lasts three or four years only, and at the age of five or six, he is old and enervated. Hence, a male for breeding should be

* L'Hist. Gen. des Voyages, tom. i. p. 518.

large.

large, handſome, and not exceeding two years of age. His neck ſhould be ſhort and fleſhy; his head light; his ears pendant; his thighs thick; his limbs firm; his hair black, thick, and ſoft; and his beard long and buſhy. The choice of the female is not of equal importance. It may only be remarked, that thoſe which have large bodies, thick thighs, a light walk, long and capacious udders, and ſoft buſhy hair, ought to be preferred. The females are in ſeaſon during the months of September, October, and November: But, when allowed to approach the male, they are willing to receive him, and are capable of producing, in all ſeaſons. They, however, hold much ſurer in autumn; and the months of October and November are preferred; becauſe the young kids are brought forth when the graſs is tender. They go with young about five months, and are delivered in the beginning of the ſixth. They ſuckle their young a month or ſix weeks. Thus, ſix months and a half ſhould be reckoned between the time when they are covered, and that when the kid begins to feed upon paſture.

When paſtured along with ſheep, the goats always take the lead of the flock. They love to feed ſeparately upon the tops of hills, and prefer the moſt elevated and rugged parts of mountains. They find ſufficient nouriſhment in heathy, barren, and uncultivated grounds. They do infinite miſchief when permitted to go

among corn, vines, copſes, or young plantations; for they eat with avidity the tender b[...] young ſhoots of trees, which generally prove fatal to their growth. They carefully avoid moiſt ground, marſhy meadows, and rich paſtures. They are ſeldom reared in plain countries, where they never thrive, and where their fleſh is always bad. Vaſt quantities are reared in warm climates; and they are never p[...] ſtables. In France, they would periſh, if not ſheltered during winter. They require no litter in ſummer; but, in winter, as moiſture is very hurtful to them, they ſhould be frequently ſupplied with freſh litter, and never allowed to lie upon their own dung. They are conducted to the fields very early in the morning, graſs covered with dew, which is injurious to ſheep, being extremely ſalutary to goats. As they are untractable and wandering animals, one man, however robuſt and active, is unable to manage above fifty of them. They are never permitted to go out during ſnow or hoar-froſt; but are fed in the ſtable with herbage, ſmall branches of trees collected in autumn, cabbages, turnips, and other roots. The more they eat, the quantity of their milk is the greater. To increaſe the quantity of milk ſtill more, they are made to drink much, by mixing a little nitre or ſalt with their water. The milk may be drawn from them five days after bringing forth; and they continue to yield conſiderable quantities of it,

it, every morning and evening, for four or five [illegible] The female produces but one kid, though sometimes two, seldom three, and never more than four. She is fertile from one year or eighteen months, till she be seven years of age. The male may propagate as long, and perhaps longer, if he were properly managed; but [illegible] is seldom employed above five years. [illegible] then sent to be fattened among the old and [illegible]ng male goats, which have been castrated, to render their flesh more tender and succulent. These are fattened in the same manner as wedders. But, whatever attention is bestowed on them, or however they are fed, their flesh is never so good as mutton, except in very warm climates, where mutton is always ill tasted.

The strong odour of the he-goat proceeds not from his flesh, but from his skin. These animals, which are not permitted to grow old, might perhaps live ten or twelve years. Whenever they cease to multiply, they are killed, and the older they are, their flesh is the worse. Both males and females, with very few exceptions, are furnished with horns. The colour of their hair is exceedingly various. It is said, that those which are white, and have no horns, give most milk; and that the black goats are the strongest. Though the food of these animals costs almost nothing, yet they fail not to bring considerable profit. Their flesh, tallow, [illegible]

and

and skin are valuable commodities. Their milk is more wholesome and better than that of the sheep: It is used as a medicine, curdles easily, and makes very good cheese. As it contains few oily particles only, the cream should never be separated from it. The females allow themselves to be sucked by infants, to whom their milk affords very good nourishment. Like cows and sheep, they are sucked by the *viper*, and still more by a bird called the *goat-sucker*, which fixes on their paps during the night, and, it is said, makes them lose their milk *.

The goat has no cutting teeth in the upper jaw. Those of the under jaw fall out, and are replaced in the same time, and in the same order, as the teeth of the sheep. The age of the goat is indicated by the teeth and the knobs of the horns. The number of teeth in the she-

* That the viper sucks cows, sheep, and goats, has all the appearances of a vulgar error; and should not, therefore, have been related so seriously, unless the author could have supported what he advances with the most unquestionable facts. As to the goat-sucker, though it has been blamed for this practice by most naturalists, yet I am convinced, that the accusation has not the smallest foundation in truth. This bird, which feeds upon moths, flies, and other insects, has indeed the power of opening its mouth to an uncommon width. But nothing can be more opposite to the structure of parts necessary for the operation of sucking, than the bill of a bird. The frequent attendance of these birds upon cattle of all kinds has probably given rise to this ridiculous notion. They attend cattle, not to suck them, but to seize the flies and other insects which perpetually assemble about these animals. This reasoning will acquire additional force, when it is considered, that the goat-sucker attends males as constantly as females.

goat is not uniform: They are generally fewer than thoſe of the male, whoſe hair is alſo more wide, and his beard and horns longer. Theſe animals, like the ox and ſheep, have four ſtomachs, and chew the cud. Their ſpecies is more univerſally diffuſed than that of the ſheep. Goats, every way ſimilar to our own, are found in many parts of the world. They are only ſmall in Guiney, and other warm climates, and large in Muſcovy, and other northern regions. The goats of Angora or of Syria, with pendent ears, are of the ſame ſpecies with ours; for they intermix together, and produce even in our climates. The horns of the male are equally long with thoſe of the common kind; but they are directed and contorted in a different manner. They extend horizontally from each ſide of the head, and form ſpirals nearly like thoſe of a ſcrew. The horns of the female are ſhort, bend backwards, downwards, and then advance forwards, ſo as to terminate near the eyes; but their direction and contour are not always uniform. The preſent deſcription was taken from a male and a female in the royal menage. Like moſt Syrian animals, their hair was very long and buſhy, and ſo fine, that cloths, as beautiful and gloſſy as ſilken ſtuffs, are made of it.

Plate XVIII.

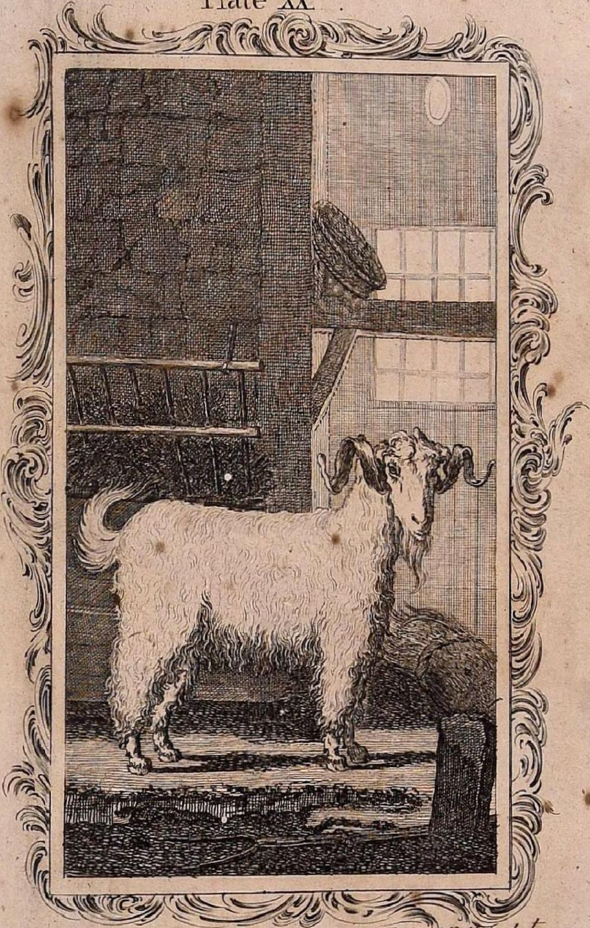
A. Bell Sculp.

HE GOAT

Plate XIX.

SHE GOAT

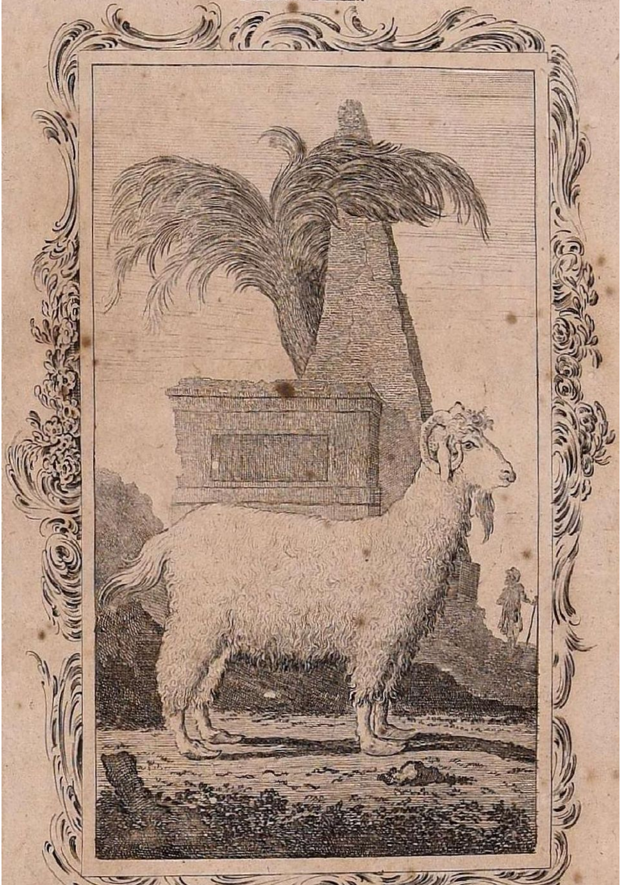
Plate XX.



A. Bell Sculp.t

HE GOAT of ANGORA

Plate XXI.



A. Bell Sculp.t

SHE GOAT of ANGORA

SUPPLEMENT.

We are informed by Pontoppidan *, that goats are ſo numerous in Norway, that, from the port of Bergen alone, 80,000 raw hides are annually exported, without reckoning thoſe which have been dreſſed. Goats, indeed, ſeem to be well adapted to the nature of this country: They ſearch for their food upon the tops of the higheſt and moſt rugged mountains. The males are very courageous; they fear not the attack of a ſingle wolf, and even aſſiſt the dogs in defending the flock.

* Nat. Hiſt. of Norway.

The HOG, the HOG of SIAM, and the WILD BOAR*

I HAVE joined theſe three animals, becauſe they form but a ſingle ſpecies. The one is the wild animal, the other two are the ſame animal, only in a domeſtic ſtate. Though they differ in ſome external marks, and perhaps likewiſe in ſome habits; yet, as theſe differences are not eſſential, but relative to their condition, as their nature is not altered by their ſlavery, and, laſtly, as they can produce, by intermix-

* The common hog or ſow is cloven hoofed, and has cutting teeth in both jaws, and two large tuſks above and below. The body is covered with briſtles. In a wild ſtate, it is of a dark brinded colour; beneath the briſtles, there is ſoft, curled, ſhort hair; and the ears are ſhort, and a little rounded. When tame, the ears are long, ſharp-pointed, and ſlouching; and the colour is generally whitiſh, but ſometimes mixed with other colours; *Pennant, Synopſ.* p. 68.

Gen. Charact. Sus, dentes primores ſuperiores iv. inferiores vi. prominentes. Laniarii ſuperiores ii. breviores, inferiores i. exſerti. Roſtrum truncatum, prominens, mobile. *Spect. Charact.* Sus ſcrofa, dorſo antice ſetoſo, cauda piloſa; *Linn. Syſt.* 102.

Sus fera, aper, Plin. lib. viii. c. li. Geſner, quad. 918.

Sus agreſtis, ſive aper, wild boar or ſwine. Raii ſyn. quad. 96.

Wieprz leſny, Dzik, Rzaczynſki Polon. 213.

Schwein, Klein. quad. 25.

Sus caudatus, auriculis brevibus, ſubrotundis, cauda piloſa. *Briſſon.* quad. 75.

ture,

t... le individuals, the only character which conſtitutes a diſtinct and permanent ſpecies, they ought not to be treated as ſeparate animals.

Theſe animals are remarkably ſingular: Their ſpecies is ſolitary and detached. It is approached by ... neighbouring ſpecies, which, like that of the horſe and aſs, and of the ſheep and goat, may be regarded as principal or as acceſſory. Neither is it ſubject to a variety of races, like that of the dog. It participates of ſeveral ſpecies; but differs eſſentially from the whole. Let thoſe who wiſh to limit the immenſity of Nature to the contracted views of imperfect ſyſtems, attend to this animal, and they will diſcover, that it eludes all their methodical arrangements. Its extremities, which are *cloven-hoofed*, have no reſemblance to thoſe that are *whole-hoofed*. It even reſembles not the *cloven-hoofed* animals; becauſe, though it appears to have two toes only, it has actually four concealed within. It has no reſemblance to the *digitated* quadrupeds; becauſe it walks on two toes only, and the other two are neither ſo ſituated, nor extended ſo far, as to ſerve the purpoſes of walking. It has, therefore, equivocal or ambiguous characters, of which ſome are apparent and others concealed. Shall we conſider this as an error of Nature, and maintain that the two internal toes ſhould not be reckoned? But this error is conſtant. Beſides, in this animal, the other bones of the foot have no reſemblance to thoſe of cloven-footed ani-

mals; and there are other differences still more striking: For the latter have horns, and no teeth in the upper jaw; they have four ſtomachs, chew the cud, &c. But the hog has no horns, only one ſtomach, does not ruminate, and has cutting teeth both above and below. It is evident, therefore, that he belongs neither to the genius of whole-hoofed, nor to that of cloven-hoofed. He has as little pretenſion to be ranked with the digitated quadrupeds; for he differs from them not only in the extremity of his foot, but ſtill more in his teeth, ſtomach, inteſtines, internal parts of generation, &c. All we can ſay, is, that, in ſome reſpects, he forms the link between the whole and cloven-footed animals, and, in others, between the cloven-footed and digitated animals; for, in the number and arrangement of his teeth, he differs leſs from the whole-hoofed quadrupeds than from the other kinds. He alſo reſembles them in the prolongation of the jaws, and, like them, he has but one large ſtomach; but, by an appendix attached to it, as well as by the poſition of the inteſtines, he ſeems to approach towards the cloven-footed or ruminating animals. He likewiſe reſembles them in the external parts of generation; and, at the ſame time, he reſembles the digitated quadrupeds in the form of his legs, in the habit of his body, and in the number of his progeny. Ariſtotle * is the

* Quadrupedum autem, quæ ſanguine conſtant, eadem quæ animal generant, alia multifida ſunt; quales hominis manus

the firſt writer who divided quadrupeds into whole-hoofed, cloven-hoofed, and digitated, and he allows that the hog is an ambiguous genus. But the only reaſon he aſſigns is, that, in Illyria, Pœonia, and ſome other places, there are whole-hoofed hogs. This animal ſtill affords a kind of exception to two general laws of nature, namely, that the larger the animals, they are the leſs prolific; and that digitated animals are the moſt fertile. The hog, though of a ſize far beyond mediocrity, produces more than any other quadruped. By this ſurpriſing fecundity, as well as by the ſtructure of the ovaria of the female, it ſeems to conſtitute the extremity of the viviparous ſpecies, and to approach to thoſe of the oviparous. In fine, the hog ſeems to be of an equivocal nature, or rather he appears ſo to thoſe who miſtake the hypothetical arrangement of their ideas for the common order of Nature, and who only perceive, in the infinite chain of being, ſome conſpicuous points to which they incline to refer every natural phænomenon.

To circumſcribe the ſphere of Nature is not the proper method of acquiring the knowledge

nus pedeſque habentur. Sunt enim quæ multiplici pedum fiſſura digitentur, ut canis, leo, panthera. Alia biſulca ſunt, quæ forcipem pro ungula habeant, ut oves, capræ, cervi, equi fluviatiles. Alia infiſſo ſunt pede, ut quæ ſolipedes nominantur, ut equus, mulus. Genus ſane ſuillum ambiguum eſt; nam et in terra Illyriorum, et in Pœonia, et nonnullis aliis locis, ſues ſolipedes gignuntur. *Ariſtot. de Hiſt. Animal. lib.* ii. *cap.* i.

of her. We cannot judge of her, by making her act agreeably to our particular and limited views. We can never enter deeply into the designs of the Author of Nature, by ascribing to him our own ideas. Instead of limiting the powers of Nature, we ought to enlarge and extend them; we should regard nothing as impossible, but believe that every thing which can have existence, does really exist. Ambiguous species, and irregular productions, would not then excite surprise, but appear to be equally necessary as others, in the infinite order of things. They fill the intervals, and constitute the intermediate links of the chain. These beings present to the human intellect curious examples, where Nature, by appearing to act upon an unusual model, makes a greater display of her powers, and affords us an opportunity of recognising singular characters, which indicate that her designs are more general than our contracted views, and that, if she has made nothing in vain, neither are her operations regulated by the designs which we attribute to her.

Does not this singular conformation of the hog merit a few reflections? He appears not to have been constructed upon any original or perfect model; for he is a composition of different animals. Some of his parts, for example, the toes above described, the bones of which are perfectly formed, are evidently of no use to him. Nature, therefore, in the construction of beings,

is by no means ſubjected to the influence of final cauſes. Why ſhould ſhe not ſometimes give redundant parts, when ſhe often denies thoſe which are eſſential? How many animals are deprived of ſenſes and of members? Why ſhould we imagine, that, in each individual, every part is uſeful to its neighbour, and neceſſary to the whole? Is it not enough that they exiſt together, that they never injure each other, that they can grow and expand without mutual deſtruction? Every thing which is not ſo hoſtile as to deſtroy, every thing that can ſubſiſt in connection with other things, does actually ſubſiſt: And, perhaps, in moſt beings, there are fewer relative, uſeful, or neceſſary parts, than thoſe which are indifferent, uſeleſs, or redundant. But, as we always wiſh to make every thing refer to a certain end, when parts have no apparent uſes, we either ſuppoſe that their uſes are concealed from us, or invent relations which have no exiſtence, and tend only to throw an obſcure veil over the operations of Nature. It is the intention of true philoſophy, to inſtruct us *how* objects exiſt, and the manner in which Nature acts. But we pervert this intention, by attempting to inveſtigate *why* objects are produced, and the ends propoſed by Nature in producing them.

This general and preſumptuous prejudice, which ſerves only to conceal our ignorance, is both uſeleſs and prevents the diſcovery of natural truths. Without deviating from our ſubject, ſome

ſome examples may be given where theſe intentions, which we ſo arrogantly aſcribe to Nature, are evidently falſe and contradictory. The phalanges of the hand or foot are ſaid to be formed for the purpoſes of producing fingers and toes; yet, in the hog, the phalanges are uſeleſs, becauſe they give riſe to no toes which benefit the animal: and cloven-hoofed animals have ſmall bones in their feet, which do not even form phalanges. Hence, if Nature intended to produce toes in theſe animals, it is evident, that, in the hog, ſhe has only half executed her deſign, and, in the others, that ſhe has hardly begun it.

The allantois is a membrane accompanying the fœtus of the ſow, the mare, the cow, and ſeveral other animals. As this membrane adheres to the bladder of the fœtus, it was ſaid to be deſtined for the reception of the urine diſcharged during the time of geſtation. At the inſtant of birth, an inconſiderable quantity of liquor is found in the allantois. In the cow this liquor is perhaps moſt abundant; and yet the allantois contains a few pints only: The capacity of the membrane is here ſo great, that no proportion ſubſiſts between it and the liquor. This membrane, when filled with air, forms a double bag in the ſhape of a creſcent, about thirteen or fourteen feet long, by nine, ten, eleven, and ſometimes twelve broad. Is a veſſel, capable of containing ſeveral cubic feet, neceſſary for the reception

reception of three or four pints of fluids? The bladder of the fœtus, if not pierced at the bottom, would itſelf be ſufficient to contain this quantity, as it does in man and other animals, in which no allantois has hitherto been diſcovered. Hence this membrane is not deſigned for receiving the urine of the fœtus, nor for any purpoſe that we can aſcribe to it; for, if it were filled, as, according to our mode of reaſoning, it ought ſometimes to be filled, it would be as large as the body of the mother. Beſides, as it burſts at the moment of birth, and is thrown away along with the other membranes which inveſt the fœtus, it is equally uſeleſs then as it was before.

The number of paps, in every ſpecies of animals, it has been ſaid, is proportioned to the number of young which the female is capable of producing and ſuckling. But why ſhould the male, who never produces, have generally the ſame number of paps? And why ſhould the ſow, which often produces eighteen, and even twenty pigs, have only twelve paps, and ſometimes fewer? Does not this prove that the operations of Nature are not to be judged of by final cauſes, or moral fitneſs, but by examining the manner in which ſhe acts, and by employing, to acquire a knowledge of her, all thoſe phyſical relations exhibited to us by the immenſe variety of her productions? I allow, that this method, which is the only path that can conduct us to real

real knowledge, is incomparably more difficult than the other, and that there are innumerable facts in Nature, to which, like the preceding, it cannot be applied with success. However, instead of searching for the use of this great capacity in the allantois, and finding that it neither serves, nor can serve, any purpose, we ought to inquire into those physical relations which may indicate the origin of its production; by observing, for example, that, in animals whose stomach and intestines are not very large, the allantois is either very small, or does not exist; and that, consequently, the production of this membrane has some connection with the great capacity of the intestines, &c. In the same manner, by considering, that the number of paps is not equal to the number of young, admitting only the most prolific animals to have the greatest number of paps, we may conjecture, that this numerous production depends on the conformation of the internal parts of generation, and that, between the number or arrangement of these parts, and of the paps, there is a physical relation which ought to be investigated.

But I only point out the true path, this not being a proper place for prosecuting such nice discussions. However, I must remark, that numerous productions depend more upon the structure of the internal parts of generation than any other cause: They depend not upon the quantity

tity of seminal fluid, otherwise the horse, the stag, the ram, and the goat, would be more prolific than the dog, the cat, and other animals which secrete less semen in proportion to their size. But the prolific powers of the latter far exceed those of the former. Neither does the number of young depend upon the frequency of coition; for, in the sow and bitch, one embrace is sufficient for the production of a numerous progeny. The longer or shorter time occupied in discharging the semen, seems likewise to have no influence on the number of young; for the dog remains long only in consequence of an obstacle arising from the structure of the parts; and, though the boar is retained by no such obstacle, and continues longer than most animals; yet no conclusion can be drawn from this circumstance in favour of a numerous progeny, since the cock requires but an instant to impregnate all the eggs which a hen can produce in the course of a month. I shall afterwards unfold the ideas I have here accumulated, solely with a view to show, that a simple probability, or conjecture, when founded on physical relations, brings more light and greater advantages than the whole group of final causes put together*.

To the peculiarities already related, some others remain to be added. The fat of the hog

* This is another bold and inconclusive attack upon final causes. See the note vol. II. p. 70.

differs

differs from that of almoſt every other quadruped, not only in its conſiſtence and quality, but in its poſition in the body of the animal. The fat of man, and of thoſe animals which have no ſuet, as the dog, the horſe, &c. is pretty equally intermixed with the fleſh. The ſuet of the ſheep, goat, deer, &c. is placed at the extremities of the fleſh. But the lard of the hog is neither mixed with the fleſh, nor collected at its extremities. It covers the whole animal in the form of a thick, diſtinct, and continued ſtratum between the fleſh and the ſkin. This phænomenon likewiſe takes place in the whale and other cetaceous animals.

What is ſtill more ſingular, the hog ſheds not his fore-teeth; they continue to grow during life. He has ſix cutting teeth in the under jaw, and a correſponding number in the upper. But, by an irregularity, of which there is not another example in Nature, the figure of the ſix teeth in the under jaw is different from that of thoſe in the upper; for, inſtead of being ſharp and cutting, the latter are long, cylindrical, blunt at the points, and form nearly a right angle with thoſe in the upper jaw; ſo that their extremities apply to each other in a very oblique manner.

Tuſks, or very long canine teeth, are peculiar to the hog, and two or three other ſpecies of animals. They differ from other teeth, by extending out of the mouth, and continuing to grow during life. In the elephant and ſea-cow,

cow, they are cylindrical, and ſeveral feet in length. In the wild boar and male hog, I have ſeen the tuſks from nine to ten inches long. They are flat, ſharp, and bend in a circular form. They ſink very deep in the ſocket; and, like thoſe of the elephant, they have a cavity at their ſuperior extremity. The tuſks of the elephant and ſea-cow are placed in the upper jaw, and there are no canine teeth in the under jaw. But the male-hog and wild boar have tuſks in both jaws; and thoſe of the under jaw are moſt uſeful to the animal, and alſo moſt dangerous; for it is with them that the wild boar wounds thoſe who attack him.

The common ſow, the wild ſow, and the caſtrated domeſtic boar, have likewiſe four canine teeth in the under jaw; but they are much leſs than thoſe of the male, and never extend beyond the mouth. Beſides theſe ſixteen teeth, namely, twelve cutting and four canine, they have twenty-eight grinders, which make forty-four in all. The tuſks of the wild boar are larger, his ſnout ſtronger, and his head longer than thoſe of the domeſtic hogs. His feet are alſo larger, his toes more ſeparated, and his briſtles are always black.

Of all quadrupeds, the hog is the moſt rude and brutal. The imperfections of his form ſeem to have an influence on his nature and diſpoſitions. All his habits are groſs; all his appetites are impure; all his ſenſations are confined

fined to a furious luſt, and a brutal gluttony. He devours indiſcriminately every thing that comes in his way, even his own progeny, the moment after their birth. This voraciouſneſs ſeems to proceed from the perpetual cravings of his ſtomach, which is of an immoderate ſize; and the groſſneſs of his appetites, it is probable, ariſes from the bluntneſs of his ſenſes of taſte and of feeling. The rudeneſs of the hair, the hardneſs of the ſkin, and the thickneſs of the fat, render theſe animals leſs ſenſible to blows. Mice have been known to lodge upon a hog's back, to eat his ſkin and his fat, without his ſhowing any marks of ſenſibility. The other ſenſes of the hog are very good. It is well known to the hunters, that the wild boar hears and ſmells at a great diſtance; for, in order to ſurpriſe him, they are obliged to watch him in ſilence during the night, and to place themſelves oppoſite to the wind, that he may not perceive the ſmell, which never fails to make him turn back.

The imperfection of the ſenſes of taſte and feeling in the hog, is farther augmented by a leprous diſeaſe, which renders him almoſt totally inſenſible. This malady proceeds, perhaps, leſs from the texture of the fleſh or ſkin, than from the natural dirtineſs of the animal, and the corruption that muſt reſult from the putrid food he ſometimes devours; for the wild boar, who generally lives upon grain, fruits, acorns, and

roots,

roots, is not ſubject to this diſtemper; neither is the pig while it continues to ſuck. There is no method of preventing it, but by keeping the domeſtic hog in a clean ſtable, and feeding him with wholeſome nouriſhment. His fleſh will become excellent, and his fat firm and tender, if he is kept for fifteen days or three weeks in a paved ſtable, without litter, and always clean, giving him only dry wheat to eat, and allowing him to drink very little. For this purpoſe, a *hog* of a year old, in good health, and half-fattened, ſhould be choſen.

The ordinary method of fattening *hogs* is to give them plenty of barley, acorns, cabbages, boiled peas, roots, &c. and water mixed with bran. In two months they are fat; their lard is thick, but neither firm nor white; and their fleſh, though good, is ſomewhat inſipid. They may be fattened much cheaper in woody countries, which produce acorns, and other nuts, by leading them into the foreſts, during autumn, when cheſnuts, acorns, beach-maſt, &c. fall and quit their huſks. They eat indiſcriminately all wild fruits, and ſoon fatten, eſpecially if, on their return in the evening, they be ſerved with lukewarm water mixed with a little bran and peaſe-meal. This drink makes them ſleep, and take on fat to ſuch a degree, that they ſometimes are unable to walk, or move themſelves. They fatten much ſooner in autumn than in any other ſeaſon, both becauſe their

 food

food is more plentiful, and becauſe they loſe leſs by perſpiration than in the ſummer months.

In fattening *hogs*, it is unneceſſary to delay, as we do with other cattle, till they be full grown; for, the older they are, they fatten with more difficulty, and their fleſh is not equally good. Caſtration, which ought always to precede the fattening of *hogs*, is generally performed at the age of ſix months, and in the ſpring or autumn; becauſe great heat or great cold renders the wound dangerous or difficult to cure; for the operation is commonly performed by inciſion, though ſometimes by a ſimple ligature. When caſtrated in ſpring, they are fattened the following autumn, and are ſeldom allowed to live two years. However, they continue to grow during the ſecond, third, fourth, and even the fifth year. Thoſe which are remarkable for their ſize and corpulence, are too old, and have been ſeveral times fed in the foreſt. The continuance of their growth ſeems not to be limited to four or five years. The boars kept for propagation grow larger during the ſixth year; and the wild boar is larger and fatter, in proportion to his age.

The life of the wild boar may be extended to twenty-five or thirty years *. Ariſtotle ſays, that hogs in general live twenty years; and adds, that both males and females are fertile till they arrive at the age of fifteen. They can en-

* See La Venerie de du Fouilloux, p. 57.

gender

gender at the age of nine or twelve months; but it is better to restrain them till they are eighteen months, or two years. The first litter of the sow is not numerous; and, when only one year old, her pigs are weak, and even imperfect. She may be said to be in season at all times. Though full, she solicits the approach of the male. This may be regarded as an excess among animals; for almost every other species refuse the male after conception. The ardour of the sow, though almost perpetual, is, however, marked by paroxysms and immoderate movements, which always terminate by her wallowing in the mire. She, at the same time, emits a thick whitish fluid. She goes four months with young, brings forth in the beginning of the fifth, and soon afterwards solicits the male, is impregnated a second time, and, of course, brings forth twice a year. The wild sow, which every way resembles the domestic kind, produces only once a year. This difference in fertility is probably owing to want of nourishment, and the necessity of suckling her pigs much longer than the domestic sow, which is never allowed to nurse her young above fifteen days or three weeks. Only eight or nine of the litter are kept longer; the rest are sold. In fifteen days, pigs are excellent food. As many females are unnecessary, and as castrated hogs bring most profit, their flesh being best, only two females, and seven or eight males, are left with the mother.

The male chosen for propagation should have a thick body, rather square than long, a large head, a short flat snout, large depending ears, small fiery eyes, a large thick neck, a flat belly, broad thighs, thick short legs, and strong black bristles. White hogs are never so strong as the black kind. The sow ought to have a long body, a large belly, and long dugs. She should also be of a placid temper, and sprung from a prolific race. Immediately after conception, she should be separated from the male, who is apt to injure her. When she brings forth, she should be fed plentifully, and watched to prevent her from devouring some of her young. Still greater attention is necessary to keep off the male, who would destroy the whole litter. The females are covered in the beginning of spring, that the pigs may be brought forth in summer, and have time to acquire strength and become fat before winter. But, when two litters are wanted annually, the male is given in November, that the female may bring forth in March; and she is covered a second time in the beginning of May. Some sows produce regularly every five months. The wild sow, which produces but once a year, receives the male in January or February, and brings forth in May or June. She suckles her young three or four months: She conducts, follows, and allows them not to separate from her till they be two or three years old; and it is not uncommon to see a wild

wild ſow accompanied with two or three litters. The domeſtic ſow is not allowed to ſuckle her pigs above two months. At the end of three weeks, they are led to the fields along with the mother, to accuſtom them gradually to feed as ſhe does. Five weeks afterwards, they are weaned, and get, every morning and evening, a little milk mixed with bran, or only lukewarm water and boiled vegetables.

Hogs are fond of earth-worms and particular roots, as thoſe of the wild carrot. It is in ſearch of theſe worms and roots, that they dig the ground with their ſnouts. The wild boar, whoſe ſnout is longer and ſtronger than that of the domeſtic kind, digs deeper, and always nearly in a ſtraight line: But the common hog digs irregularly and more lightly. As they do much miſchief in cultivated fields, they ſhould be fed in the foreſts, or in fallow land.

Wild boars, which have not paſſed their third year, are called by the hunters *flock-beaſts* (bêtes de compagnie); becauſe, previous to this age, they do not ſeparate, but follow their common mother. They never wander alone, till they have acquired ſtrength ſufficient to reſiſt the attacks of the wolf. Theſe animals, when they have young, form a kind of flocks; and it is upon this alone that their ſafety depends. When attacked, the largeſt and ſtrongeſt front the enemy, and, by preſſing all round againſt the weaker, force them into the centre. The do-

meſtic hogs defend themſelves in the ſame manner, and have no occaſion to be guarded by dogs. But, as they are obſtinate and untractable, an active and robuſt man is unable to manage more than fifty of them. In autumn and winter, they are conducted to the woods, where wild fruits abound; in ſummer, they are led to moiſt grounds, where they find plenty of worms and roots; and, in ſpring, they are allowed to go on waſte or fallow lands. They are let out twice a-day from March to October, and feed from the time that the dew is diſſipated in the morning till ten o'clock, and from two in the afternoon till the evening. In winter, they are let out only once a-day, when the weather is fine; for dew, ſnow, and rain, are hurtful to them. When overtaken with a ſtorm, or even a great rain, they often deſert the flock one after another, and run and cry till they arrive at the ſtable-door. The youngeſt cry ofteneſt, and loudeſt. This cry, which differs from the ordinary grunting, reſembles the cries they utter when bound with ropes, in order to be ſlaughtered. The male cries leſs frequently than the female. The wild boar ſeldom cries, unleſs when he is wounded in combat. The wild ſow cries oftener; and, when ſuddenly frighted, ſhe blows with ſuch violence as to be heard at a great diſtance.

Though extremely gluttonous, they never attack or devour other animals; but they ſometimes eat putrid fleſh. Wild boars have been

obſerved eating the fleſh of horſes, and the ſkin of the roebuck, and the claws of birds, have been found in their ſtomachs. But, perhaps, this proceeds more from neceſſity than inſtinct. It cannot, however, be denied, that they are very fond of blood, and of freſh and bloody fleſh; for hogs devour their own young, and even infants in the cradle. Whenever they find any ſucculent, moiſt, or unctuous ſubſtance, they firſt lick, and then ſwallow it. In their return from the fields, I have ſeen a whole herd ſtop round a piece of new ploughed clay-land, which, though but ſlightly unctuous, they all licked, and ſome of them ſwallowed conſiderable quantities of it. Their gluttony, as formerly remarked, is equally groſs as their nature is brutal. They have no ſentiments which are very diſtinct. The pigs hardly know their mother, or, at leaſt, they are extremely apt to miſtake her, and to ſuck the firſt ſow that will permit them. Fear and neceſſity ſeem to confer more ſentiment and inſtinct upon wild hogs. The young are more attached to their mother, and ſhe appears to be more attentive to them, than the domeſtic ſow. In the rutting ſeaſon, the male follows the female, and generally remains with her about thirty days in the thickeſt and moſt ſolitary receſſes of the foreſt. He is then more ferocious than ever: When another male endeavours to occupy his place, he becomes perfectly furious; and they fight, wound, and often kill each other.

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The wild ſow is never furious but when her pigs are attacked: And it may, in general, be remarked, that, in almoſt all wild animals, the males, during the rutting ſeaſon, and the females, after they bring forth, become more or leſs furious.

The wild boar is hunted with dogs, or killed by ſurpriſe during the night, when the moon ſhines. As he flies ſlowly, leaves a ſtrong odour behind him, and defends himſelf againſt the dogs, and often wounds them dangerouſly, fine hunting dogs are unneceſſary, and would have their noſe ſpoiled, and acquire a habit of moving ſlowly by hunting him. Maſtiffs, with very little training, are ſufficient. The oldeſt, which are known by the tract of their feet, ſhould only be attacked: A young boar of three years old is difficult to hunt down; becauſe he runs very far without ſtopping. But the older boars do not run far, allow the dogs to run near, and often ſtop to repel them. During the day, he commonly remains in his ſoil, which is in the moſt ſequeſtered part of the woods. He comes out in the night in queſt of food. In ſummer, when the grain is ripe, it is eaſy to ſurpriſe him among the cultivated fields, which he frequents every night. As ſoon as he is ſlain, the hunters cut off his teſticles, the odour of which is ſo ſtrong, that, in a few hours, it would infect the whole fleſh. The ſnout of an old boar is the only part that is eſteemed; but every part of the caſtrated and young boar, not exceeding one

year

year fed, makes delicate eating. The pork of the domeſtic boar is ſtill worſe than that of the wild boar; and can only be rendered fit for eating by caſtration and fattening. The ancients * caſtrated the young boars which they could carry off from their mothers, and returned them to the woods, where they grew fat, and their pork was much better than that of domeſtic *hogs*.

To thoſe who live in the country, the profits ariſing from the hog are well known. Pork ſells nearly as dear as beef; the lard brings double or triple the price; the blood, the inteſtines, the feet, the tongue, are all prepared and uſed as food. The dung of the hog is colder than that of other animals, and ſhould not be uſed but in grounds which are too warm and too dry. The fat of the inteſtines and web, which differs from common lard, is employed for greaſing axles of wheels and many other purpoſes. Sieves are made of the ſkin, and bruſhes, pencils, &c. of the briſtles. The fleſh of the hog takes ſalt better, and keeps longer, than that of any other animal.

This ſpecies, though very numerous, and diffuſed over Europe, Aſia, and Africa, exiſted not in the New Continent, till they were tranſported thither, and to moſt of the American iſlands, by the Spaniards. In many places they have multi-

* See Ariſt. Hiſt. Animal. lib. vi. cap. 28.

plied

plied greatly, and become wild. They reſemble our boars; and their bodies are ſhorter, and their ſnout and ſkin thicker, than the domeſtic hogs, which, in warm climates, are all black, like the wild boar.

By a ridiculous prejudice, which ſuperſtition alone could ſupport, the Mahometans are deprived of this uſeful animal. They have been told that it is unclean; and, therefore, they dare not either touch or feed it. The Chineſe, on the contrary, are extremely fond of pork. They rear hogs in numerous flocks, and pork is their moſt common food. This circumſtance is ſaid to have prevented them from embracing the religion of Mahomet. The Chineſe hogs, as well as thoſe of Siam and India, differ a little from the common kind. They are ſmaller, have ſhorter legs, and their fleſh is whiter and more delicate. They are reared in ſeveral places of France; and they intermix and produce with the domeſtic hog. Numbers of them are reared by the Negroes; and, though there are few of them among the Moors, or in the countries inhabited by Mahometans; yet wild boars are as common in Aſia and Africa as in Europe.

Hence theſe animals affect not any particular climate: But the boar, by becoming domeſtic, ſeems to have degenerated more in cold than in warm countries. A very ſlight alteration of climate is ſufficient to change their colour. In

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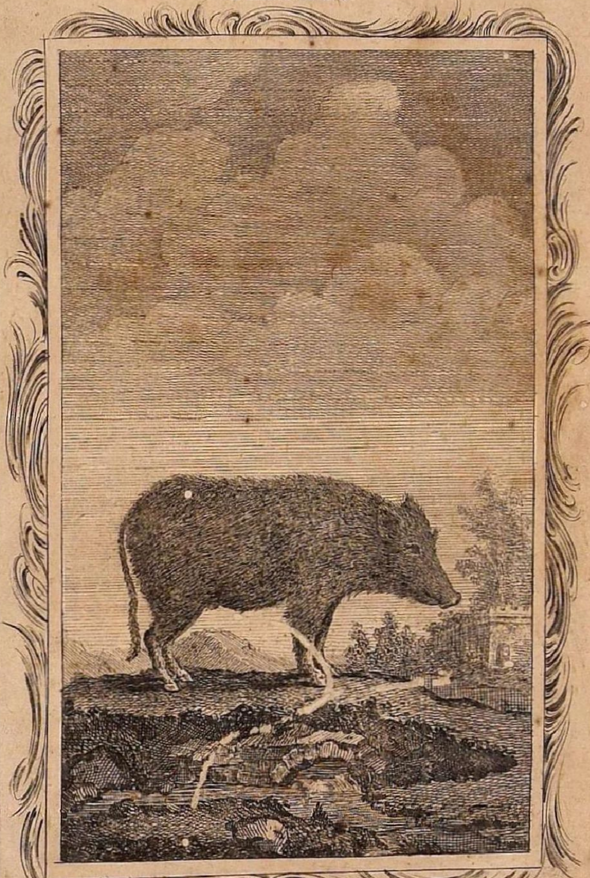
the northern provinces of France, and even in Viverais, the hogs are generally white; but in Dauphiny, which is at no great diſtance, they are all black; and thoſe of Languedoc, Provence, Spain, Italy, India, China, and America, are of the ſame colour. The hog of Siam has a greater reſemblance to the common hog than to the wild boar. The ears furniſh the moſt evident mark of degeneration; for they become more ſupple, ſoft, inclined, or pendulous, in proportion as the animal is altered, or rather as he has been ſoftened by education in a domeſtic ſtate: And, in fact, the ears of the domeſtic hog are more flexible, longer, and more inclined than thoſe of the wild boar, which ought to be regarded as the model of the ſpecies.

SUPPLEMENT.

I have little to add concerning the hogs of Europe, of Siam, and of China, which intermix together, and therefore conſtitute but one ſpecies. Thoſe of Europe are conſiderably larger than the other races; and their ſize might be ſtill farther augmented, if they were allowed to live longer. Mr. Colinſon, Fellow of the Royal Society of London, informed me, by a letter dated January 30, 1767, that a *hog*, which was fattened by Mr. Joſeph Leaſtarm, and killed by one Meek, a butcher in Cheſhire, weighed 850 pounds, including head, inteſtines, &c.

END OF THE THIRD VOLUME.

Plate XXII.



W.3 A. Bell Sculpt.

BOAR of SIAM

Plate XXIII.

W.S. A. Bell Sculp.

COMMON WILD BOAR

Plate XXIV.

A. Bell Sculpt.

VARIETY of the WILD BOAR

Plate XXV.

A. Bell Sculp.

1. YOUNG WILD BOAR — 2. SUCKING PIG